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HISTOPATHOLOGIC STUDY OF PSORIASIS

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We wish to report our observations in regard to histologic changes in psoriasis based on studies of 1 or more specimens removed for biopsy in more than 225 cases of psoriasis, the results of the histologic studies being correlated with the clinical findings and the course of the disease. The histogenesis of the disease is considered from the earliest lesion to lesions undergoing involution as the result of treatment; the lesions of various aberrant forms of psoriasis are also considered. We shall compare our observations with various older and newer concepts regarding the histogenesis of psoriasis as given in the literature. Space, however, permits reference only to some of the more important articles in the literature, which have been reviewed in the thesis by one of us (J. W. B.).

MATERIAL STUDIED

Specimens for biopsy were taken from various types of lesions in all stages of development and involution, both typical and atypical lesions being included. Specimens were also taken at varying intervals during treatment with crude coal tar and ultraviolet radiation[1] and from aberrant forms, including so-called psoriatic arthritis, erythroderma psoriaticum and pustular psoriasis. When the effects of treatment were being studied, subsequent specimens for biopsy were taken from lesions similar to the first one and adjacent thereto. A chart was made of each case to permit correlation of clinical and histopathologic observations. The site for biopsy was encircled by injection of procaine hydrochloride, but none of the anesthetic was injected into the piece of skin to be removed. Injection of the anesthetic into the specimen would be likely to result in edematous changes. Alcohol was used sparingly to prepare the site for biopsy. Scrubbing with soap and water had to be avoided because of the readiness with which the psoriatic scales became detached. In the majority of cases an elliptic incision was made. This included the border of the normal-appearing skin as well as the psoriatic process. The tissue was routinely fixed in a 4 per cent solution of formaldehyde. Occasionally, absolute alcohol or Zenker's solution was used for special studies. In 25 cases, frozen sections were made for studies of lipids. Serial sections from several typical and aberrant lesions were studied. Routine stains in each case included hematoxylin and eosin, Van Gieson's stain and elastin H; also, frequently, silver nitrate for

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1. Goeckerman, W. H.: The Treatment of Psoriasis, Northwest Med. **24**:229-231 (May) 1925; Treatment of Psoriasis: Continued Observations on the Use of Crude Coal Tar and Ultraviolet Light, Arch. Dermat. & Syph. **24**:446-450 (Sept.) 1931. O'Leary, P. A.: A Method of Treating Psoriasis, Canad. M. A. J. **48**:34-46 (Jan.) 1943.

melanin pigment, sudan III and sudan IV for fat, Gram's stain for bacteria and the Giemsa-Mann stain for evidence of inclusion bodies. Occasionally, modifications of the Masson trichrome stain were employed on formaldehyde-fixed tissue; stains for hemosiderin were also used. None of the specimens was fixed in Bouin's solution.

In this series there were no lesions of mucous membrane that could be attributed to psoriasis. For practical reasons, no histologic studies were made in regard to psoriatic nails.

HISTOGENESIS OF PSORIASIS

We shall first describe histologic changes as seen in the early lesions, active lesions, latent lesions and lesions undergoing involution either with or without treatment and then consider the various aberrant and relatively uncommon forms of psoriasis, some of which will be discussed under diagnosis.

Early Lesions.—By early lesions we mean those that have been present clinically from two to three days to several weeks and have not progressed beyond the papular stage. The normal-appearing skin adjacent to an early papule of psoriasis showed no appreciable pathologic change. There was gradual transition from uninvolved to involved skin. Histologic changes apparently occurred first in the epidermis and consisted of a mild degree of hyperkeratosis and acanthosis. There was a partial separation of the cells of the stratum corneum, and it was the air spaces between these cells that gave the optic effect of whiteness to the scales. Gradual decrease in the stratum granulosum and increase in the thickening of the prickle cell layer (acanthosis) were observed, together with development of parakeratosis (retention of nuclei in the stratum corneum). Parakeratosis usually extended uniformly across the lesion, the nuclei being flattened out, although over suprapapillary portions of the epidermis the parakeratotic cells occasionally were oval and cytoplasm was visible. Even in early lesions, however, one at times found the corneal layer to be composed of alternate layers of nucleated and unnucleated cells. This phenomenon, according to Gans,[2] would indicate alternate number of days of activity and quiescence of the psoriatic process, the parakeratosis being dependent on the acanthosis and the degree of intracellular edema which interferes with the normal process of cornification. The granular layer occasionally was increased in relation to interpapillary acanthotic regions, especially about the orifices of the hair follicles. The stratum lucidum was observed only in lesions from the palms and soles, but special stains were not employed for demonstration of eleidin.

Acanthosis in the early lesions seemed limited to the interpapillary regions of the epidermis. These rete ridges were usually short and chubby and rather broad, projecting down as inverted cones, and occasionally revealed buds of proliferating basal cells at their tips. They varied considerably in length and thickness but tended to be spaced at regular distances. Normal mitoses occurred frequently in the basal layer but also throughout the prickle cell layer. The epidermis over the papillary bodies remained of normal thickness, to be contrasted with a thinning seen in later stages of psoriasis.

There was a moderate degree of intracellular edema and a much lesser degree of intercellular edema of the prickle cell layer. The intercellular edema was most prominent over the papillary bodies, where it even resulted in a mild degree of spongiosis. Vacuolation of prickle cells occurred chiefly in sections fixed with alcohol rather than with formaldehyde and after comparison with similar changes associated with other dermatoses was believed to be chiefly an artefact in fixation.

2. Gans, O.: Psoriasis, in Histologie der Hautkrankheiten, Berlin, Julius Springer, 1925, vol. 1, p. 280.

Sections stained with silver nitrate and counterstained with hematoxylin to demonstrate melanin pigment revealed normal distribution of pigment in the skin adjacent to the early psoriatic lesion. In the early papule, there was disappearance of melanin pigment over the tops of the basal cells and usually an absence of pigment in the prickle cell layer or rest of the epidermis. In early stages of acanthosis a few granules of melanin pigment were present in dendritic cells. The pigment seemed to be phagocytosed by chromatophores in the cutis, some of which retained the pigment even in the most active stages of the psoriatic process. Stains for iron gave negative results.

The formation of microabscesses of Munro [3] in the stratum corneum or in the upper portion of the prickle cell layer resulted from migration of leukocytes through the epidermis from the capillaries in the tips of the papillary bodies (fig. 1). Migration of leukocytes, however, also occurred through the length of the rete ridges. This phenomenon of cellular migration and microabscess

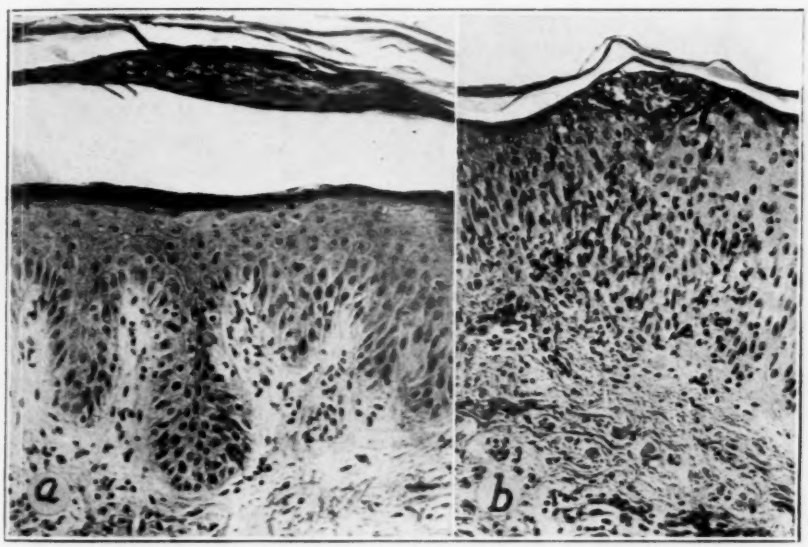

Fig. 1.—Early papular lesion (*a*), showing hyperkeratosis, parakeratosis, microabscess, proliferation of rete ridges and beginning papillomatosis (× 145); early active lesion (*b*) with migration of leukocytes through epidermis, forming microabscess (× 175).

formation was not seen in all the papillae; in fact, it was often necessary to study multiple sections before microabscesses could be demonstrated. In migrating, polymorphonuclear leukocytes were well preserved in form in the lower portions of the epidermis, but as they approached the surface they tended to be massed in clumps and to undergo various degenerative changes. These leukocytes when seen in the microabscesses in the stratum corneum showed almost complete degeneration and appeared only as masses of nuclei. A variable number of mononuclear cells and lymphocytes were found in the intercellular spaces between the prickle cells, but without evidence of migration to the stratum corneum.

Some of the degenerating polymorphonuclear leukocytes in the epidermis closely simulated the appearance of Guarnieri-like bodies. In other instances one could see edematous changes in the prickle cells with extrusion of the

3. Munro, W. J.: Note sur l'histopathologie du psoriasis, Ann. de dermat. et syph. **29**: 961-967, 1898.

nucleolus of the cell (fig. 2). Giemsa-Mann and other stains, however, failed to reveal any features of true inclusion bodies.[4] The degenerating polymorphonuclear leukocytes and extruded nuclei from edematous degenerative prickle cells, in other words, pseudo inclusion bodies, were most numerous and were seen most frequently in early and active lesions of psoriasis but were also demonstrated in smaller numbers in other dermatoses characterized by acanthosis, including contact and atopic dermatitis, seborrheic dermatitis and localized neurodermatitis. These pseudo inclusion bodies were usually somewhat acidophilic but not infrequently basophilic in their staining.

Frozen sections stained for fat revealed no increase in normal lipid content of the skin[5] either in relation to the pilosebaceous apparatus or elsewhere, nor

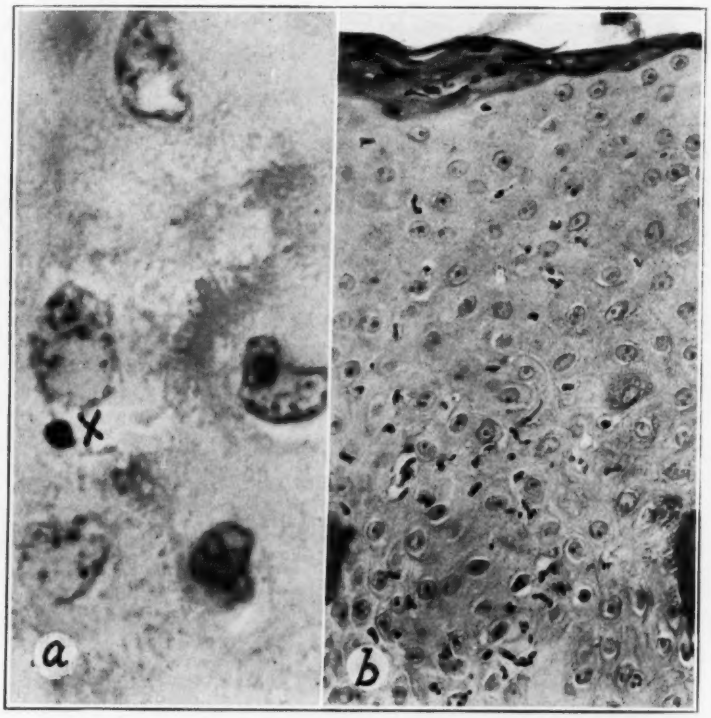

Fig. 2.—Lesion (*a*) showing degenerating prickle cells, deeply stained and swollen nuclei and extruded nucleus at *X* (× 1700); active lesion (*b*) showing leukocytes, nuclei and cellular débris that might be mistaken for inclusion bodies (× 250).

was there any variation in the lipid content histologically as compared with the results of studies of blood lipids, which revealed in some cases decided elevation in the concentration of cholesterol and total lipids.[6]

The first change in the cutis consisted of bulging of the tips of the papillary bodies, which could be interpreted as the result of prolongation of the rete

4. Dr. F. R. Heilman, who has been interested in virus diseases, studied representative sections when we were suspicious of the presence of inclusion bodies without being able to identify any Guarnieri-like bodies.

5. It was not believed that gentle cleansing of the skin with alcohol prior to removal of the specimen for biopsy removed any appreciable amount of lipid in the stratum corneum, since in the control sections of xanthomatous lesions with the same technic, lipids could be readily demonstrated in the stratum corneum.

6. Brunsting, L. A.: Personal communication on studies to be published later.

ridges, and broadening of the rete ridges with compression of the bases of the papillae. There was edema of the tips of the papillae with increase of varying degree in number of fibroblasts. There was a perivascular infiltrate which was composed chiefly of polymorphonuclear leukocytes, whereas in the upper portions of the cutis the infiltrate was predominantly mononuclear, including lymphocytes. There was no inflammatory reaction in the deeper portions of the cutis or in the subcutaneous tissue. Swelling of endothelial cells occurred in the tips of the capillaries but without appreciable dilatation of the capillaries or, as yet, in this stage, any apparent rigidity or tortuosity of the capillaries. Mast cells were frequently present. Plasma cells were of infrequent occurrence. Few eosinophils could be demonstrated in the infiltrate except in 2 instances in which the psoriatic papule had resulted from Köbner's phenomenon, and numerous eosinophils were present throughout the upper parts of the cutis. The elastic tissue was somewhat frayed and distorted by edema in the pars papillaris, but it was normal in other places. There were no changes in the dermal appendages.

Active Lesions.—The term "active lesion" was applied to a papule or plaque that was erythematous or exudative or both and in which there was a history of rapid development or progression. The histologic changes in active lesions were similar to those in the early lesions except for the degree and extent of the process. Parakeratosis was more uniform and greater. The nuclei of the parakeratotic cells were oval and lightly stained. Microabscesses were numerous and larger than in the early papular lesion and could even be found in the upper layers of the prickle cells. Intercellular edema resulted in areas of spongiosis over the papillary bodies without going to the point of vesiculation. Mitotic figures were numerous both in the basal and in the prickle cell layers. Capillaries in the papillary bodies in the upper part of the cutis were dilated and engorged with erythrocytes and leukocytes, and the same was true of the smaller venules and arterioles. The infiltrate was limited to the papillary bodies and to the upper parts of the cutis and was composed predominantly of polymorphonuclear leukocytes. Melanin pigment could be found only in occasional dendritic cells in the epidermis but was still present in varying degrees in chromatophores in the cutis. The lipid content of the epidermis again was minimal and remained within normal range and in normal situation.

Quiescent or Latent Lesions.—Clinically, these lesions were the typical scaling papules or dry scaling plaques of psoriasis in which erythema was not a prominent feature and in which there was no evidence of exudation. Histologically, there usually was decided hyperkeratosis with areas of parakeratosis overlying the stratum corneum. Air spaces were seen between otherwise normal cells in the stratum corneum. The nuclei of the parakeratotic cells were small, compressed and ill defined. Microabscesses were less prominent than in the early and active stages and often appeared as ill defined shriveled remnants in the more superficial layers. The granular layer was frequently present, especially in relation to hair follicles and in the interpapillary regions of the epidermis. There were decided acanthosis and regular proliferation of the rete ridges, which were much longer and thinner than in the early lesions. The epidermis above the papillary bodies was reduced in many cases to only a few layers of parakeratotic cells (which explains the ease with which bleeding points can be demonstrated in psoriatic plaques after gentle curettement of the scales). There was little evidence of migration of leukocytes through the epidermis. Pseudo Guarnieri bodies were few. Clubbing of the tips of the papillary bodies became more pronounced than in the earlier stages. The capillaries in the papillae were dilated,

tortuous [7] and often engorged with erythrocytes,[8] and the walls appeared to be rigid and showed a hyaline change in the connective tissue. The endothelial cells of the walls of the capillaries were fragmented and compressed rather than edematous. Similar changes were seen in the smaller vessels of the upper parts of the cutis. The infiltrate was less than in the earlier active stages. There was no change in elastic tissue, and there was little evidence of regeneration of the pigment. There was no increase in lipid content of the skin. Although specimens for biopsy were taken from apparently indolent psoriatic plaques, it was not uncommon histologically to find a focus of activity in several areas of the section, although the picture on the whole could be regarded as representing a quiescent stage.

Lesions Undergoing Involution.—Multiple specimens for biopsy were taken from 15 patients with varying stages of typical psoriatic lesions and compared with specimens taken one day to four weeks subsequent to treatment for psoriasis by the method outlined first by Dr. Goeckerman for treatment with crude coal tar and ultraviolet radiation. The lesions of each patient responded differently, depending on the age and character of the lesions. The clinical and also the histologic response to treatment were more rapid in so-called latent or quiescent lesions than in active lesions (figs. 3 and 4).

Striking changes were seen histologically in lesions that had been under treatment for ten days to two weeks. Parakeratosis was decidedly reduced or absent, and in its place there was a normal or slightly thickened stratum corneum. The granular layer was diminished or normal or occasionally showed some increase. The edema and acanthosis of the epidermis were diminished, but the edema persisted in the papillary bodies. Mitotic figures in the epidermis could rarely be demonstrated. A normal band of connective tissue appeared between the papillae of the epidermis. The infiltrate in the papillary bodies, however, was seldom less than before treatment and often was increased. At the border of the lesion, and extending well into the normal tissue, there were increased edema and vascular dilatation in the cutis where before treatment no appreciable change had been present. This could readily be explained by the stimulating action of the tar and radiation on the tissues.

Lesions that had been under treatment for three to four weeks showed evidence of more complete or even complete involution. Hyperkeratosis was minimal, parakeratosis absent and acanthosis diminished or absent. Papillomatosis, infiltration in the cutis and edema disappeared in the aforementioned order. In clearing lesions, melanin pigment first appeared in the bases of the rete ridges in basal and dendritic cells. In the lesions that had cleared under treatment with tar and ultraviolet radiation, large amounts of fine granular pigment were found extending throughout the epidermis into the stratum corneum, and there also were many chromatophores laden with pigment in the cutis. This would be expected as the result of stimulation of pigment formation by the ultraviolet light. In 1 instance a latent psoriatic plaque had cleared after seventeen days of treatment, so that there were no clinical or pathologic signs present except for slightly increased pigmentation. The pigment content of the normal skin surrounding the psoriatic lesion appeared unaffected except when ultraviolet irradiation had been employed. The fat content in the psoriatic lesions remained normal and was unaffected by treatment.

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7. Ormsby, O. S., and Montgomery, H.: Diseases of the Skin, Philadelphia, Lea & Febiger, 1943.

8. Ormsby and Montgomery,[7] p. 283, fig. 104a.

PSORIATIC ARTHRITIS

Specimens for biopsy were taken from 24 patients with psoriasis and arthritis. Fourteen of these patients had what is commonly regarded as typical psoriatic arthritis with involvement of one or more of the distal phalanges.[9] In some of the other 10 patients, there was involvement of one or more large joints, so that the relation of the psoriasis to the arthritis was thought probable but not definite. Clinically, the psoriasis in this group, as has been emphasized by Gans and Nobl,[10]

Fig. 3.—Lesion from elbow: (*a*) latent stage, before treatment; parakeratotic layer below which are a normal stratum corneum and stratum granulosum (× 115); (*b*) section from same site after seventeen days of treatment with tar and ultraviolet irradiation; skin approximately normal (× 115).

9. Canroe, B. I.: Arthritis and Allied Conditions, Philadelphia, Lea & Febiger, 1940, p. 75. Francon, F.: Le psoriasis arthropathique, Rev. belge sc. méd. **11**:109-118 (March) 1939. Hench, P. S.: Acute and Chronic Arthritis, in Nelson Loose Leaf Surgery, New York, Thos. Nelson & Sons, 1935, vol. 3, chap. 1, pp. 118-119.

10. Nobl, G.: Psoriasis, in Jadassohn, J.: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1928, vol. 7, p. 180.

was usually of a more severe type, such as the pustular or the exudative type, or appeared as an exfoliative dermatitis (fig. 5).

Histologically, there were pronounced edema in the epidermis and considerable infiltrate in the cutis, and microabscesses were especially prominent. The elastic tissue was frayed and splintered. Rupial lesions with heavy scales composed of alternate regions of hyperkeratosis and parakeratosis were often seen.

EXFOLIATIVE PSORIASIS (ERYTHRODERMA PSORIATICUM)

Histopathologic studies were made of 35 cases of psoriasis in its exfoliative stage and included 15 cases previously reported by one of us (H. M.),[11] which in turn included the majority of cases reported by Goeckerman and O'Leary[12] as cases of erythroderma psoriaticum. Our studies of this larger group of 35

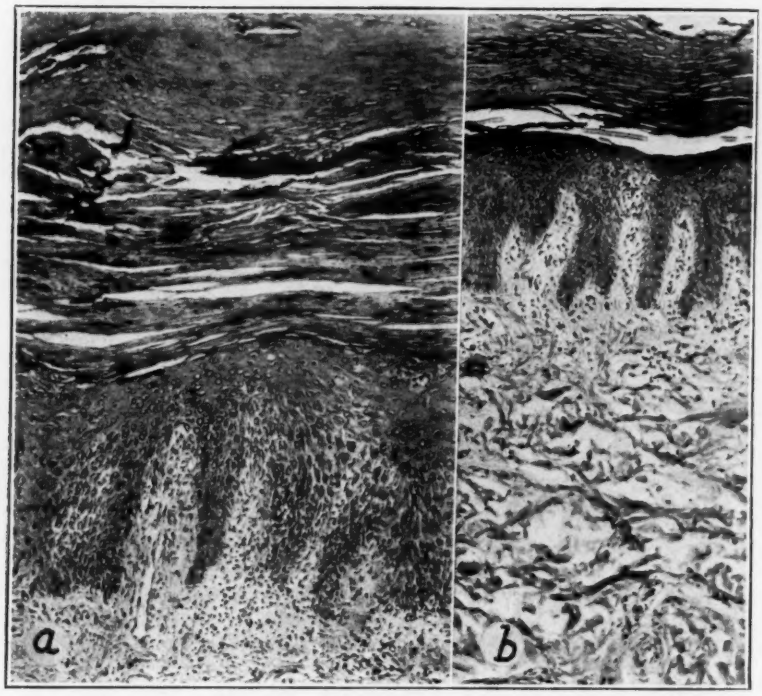

Fig. 4.—Lesion from sole: (*a*) before treatment, showing intense parakeratosis, hyperkeratosis, absent granular layer, some acanthosis and greater intercellular edema than usual, approaching spongiosis (× 70); (*b*) same region atfer treatment with tar and ultraviolet irradiation for fifteen days; approximately normal stratum corneum and granular layer, but papillomatosis and acanthosis still present (× 70).

cases simply confirmed the statement previously made that the histologic changes of exfoliative dermatitis due to psoriasis remain those of psoriasis. As in psoriatic arthritis, the histologic changes may reveal more definite inflammatory reaction than is seen in the well developed or latent psoriatic plaque. Differing also from that observed in most types of psoriasis, the infiltrate not infrequently contains numerous eosinophils. Intracellular edema is pronounced, and intercellular edema

11. Montgomery, H.: Exfoliative Dermatosis and Malignant Erythroderma: Value and Limitations of Histopathologic Studies, Arch. Dermat. & Syph. **27**:253-273 (Feb.) 1933.

12. Goeckerman, W. H., and O'Leary, P. A.: Erythroderma Psoriaticum: A Review of Twenty-Two Cases, J. A. M. A. **99**:2102-2104 (Dec. 17) 1932.

may result in regions of spongiosis and early stages of vesiculation. It becomes especially important, therefore, in these cases to select a site for biopsy that is dry rather than weeping and that has not been subjected to stimulating treatment. The scale in exfoliative psoriasis is often attached loosely in broad sheets, so that the stratum corneum and microabscesses contained therein are readily detached in preparing the site for biopsy or in the process of fixation.

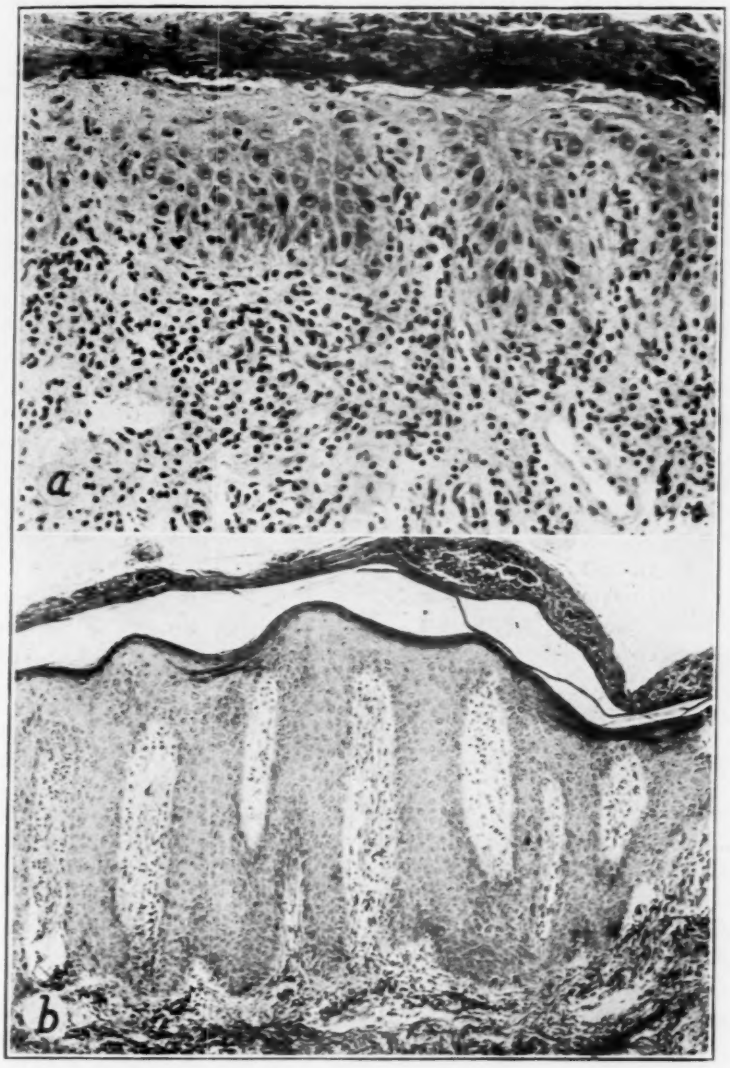

Fig. 5.—Active early lesion of glans penis (*a*) associated with psoriatic arthritis; microabscess in stratum corneum; dense infiltrate of mononuclear cells in cutis (× 205); exfoliative psoriasis; (*b*) typical changes including uniform parakeratosis with microabscess, papillomatosis, long broad rete ridges, dilated capillaries and slight infiltrate in cutis (× 100).

PUSTULAR PSORIASIS

The clinical and histologic features of 35 cases of so-called pustular psoriasis were studied. In the majority of cases the lesions were limited to the palms and soles, although several patients had typical psoriatic lesions elsewhere and others had had such lesions. Two patients had a generalized pustular psoriasis.

Typical psoriatic pitting or scaling beneath the nails was seen in several cases; there was an associated psoriatic arthritis. In 20 of the 35 cases the lesions on the palms and soles were not definitely distinguishable clinically from dermatitis repens, recalcitrant pustular eruption (pustular bacterid) or deep-seated trichophytosis.

The 35 patients presented clinical and histopathologic features as described by Barber [13] and later by many others, including Ebert.[14] The lesions on the palms and soles were usually bilateral and symmetric. The thenar eminences and the medial aspects of the arches of the feet were commonly involved. Primary lesions consisted of minute pustules, some of which became confluent and occasionally formed large abscesses. It must be acknowledged that there is no uniform agreement as to what pustular psoriasis is, as is evident from recent discussions by Dore, Barber and others.[15] In several of our cases the disease had been diagnosed as recalcitrant pustular eruption,[16] but histologically it fitted in with our concept of pustular psoriasis and responded to a psoriatic regimen.

The histologic diagnosis of psoriasis is dependent, we believe, on selection of a well developed, relatively quiescent lesion. In the stages of acute vesiculation and pustulation, exudative and inflammatory reactions in the epidermis and cutis were so pronounced that they obscured most of the histopathologic features of psoriasis. When brownish pustules which were beginning to undergo involution were studied, the histologic change was essentially that of ordinary psoriasis (fig. 6). In well developed pustules or papulopustules, microabscesses usually were multiple and larger than in ordinary psoriatic plaques and often extended deep into the epidermis. Parakeratosis might extend uniformly across the entire section or occur only in spotted regions. Rupial crusting was a frequent occurrence (fig. 6*a*). Careful search for fungi or bacteria in the stratum corneum or elsewhere gave negative results on histologic examination. Potassium hydroxide and smears also failed to disclose any organisms, as did cultures for fungi and bacteria. The cultures were performed in many of the cases. In all 35 cases the lesions showed a definite response to psoriatic treatment, although not all of them were observed until the lesions had cleared up.

DIAGNOSIS

If a well developed papule or portion of a psoriatic plaque is chosen for biopsy, one usually has little difficulty in making the histologic diagnosis. The characteristic combination of changes consists of uniform to spotted or layered parakeratosis, diminution or absence of the stratum granulosum, regular acanthosis often with bulging of the tips of the rete ridges, mild intracellular and less intercellular edema, a varying degree of normal mitoses in basal and prickle cells, uniform and regular papillomatosis with clubbing of the papillary bodies and often with thinning of the suprapapillary plates, dilatation and tortuosity of the loops of the capillary vessels, and mild perivascular infiltration of lymphocytes and monocytes in the upper portion of the cutis with migration of polymorphonuclear leukocytes through the epidermis, resulting in the formation of microabscesses. No other disease

13. Barber, H. W.: Acrodermatitis Continua Vel Perstans (Dermatitis Repens) and Psoriasis Pustulosa, Brit. J. Dermat. **42**:500-518 (Nov.) 1930.

14. Ebert, M. H.: Psoriasiform Eruption with Pustular Exacerbations, Arch. Dermat. & Syph. **27**:933-950 (June) 1933.

15. Dore, S. E.; Barber, H. W., and others, in Discussion on a Selection of Therapeutic Problems, Brit. J. Dermat. **54**:72-75 (March) 1942. Dore, S. E.: Correspondence, ibid. **54**:91 (March) 1942.

16. Andrews, G. C.; Birkman, F. W., and Kelly, R. J.: Recalcitrant Pustular Eruptions of the Palms and Soles, Arch. Dermat. & Syph. **29**:548-558 (April) 1934.

presents this combination of histologic changes. In many instances, however, multiple sections had to be made, and in others not all of these changes were present. Thus, for example, microabscesses may be difficult to demonstrate in latent or quiescent lesions, and, conversely, microabscesses per se are not diagnostic and are seen in several other dermatoses.

Fig. 6.—Pustular psoriasis on arm; (*a*) rupial crusting with microabscess, pronounced edema, clubbing of papillae, dilated capillaries and dense infiltrate in cutis (× 65); pustular psoriasis sole of foot; (*b*) migration of leukocytes through epidermis, forming microabscesses reduced to absent granular layer, sparse infiltrate in cutis (× 80) (from Ormsby and Montgomery [7]).

The most difficult differentiation histologically is between chronic plaques of psoriasis and plaques of localized neurodermatitis (lichen simplex chronicus). Both diseases presented regular hyperkeratosis, varying degree of parakeratosis, regular acanthosis and papillomatosis with long, narrow rete ridges and thinning

of the suprapapillary plates. In a chronic, quiescent psoriatic plaque, microabscesses often were absent or few and far between, and the infiltrate was composed chiefly of mononuclear cells similar to those seen in localized neurodermatitis. Dilatation, tortuosity and apparent rigidity of the walls of the capillaries usually persisted in this type of psoriasis and were absent in neurodermatitis. In a large series of cases of localized neurodermatitis, we did not see the double row basal cell layer described by MacCardle and the Engmans.[17]

When making a histologic study of generalized neurodermatitis (atopic dermatitis) one is often surprised to see the apparently thinned epidermis in proportion to the degree of palpable infiltration of the skin. Eczematoid reactions with spongiosis and vesiculation are more prominent than in most types of psoriasis. A varying degree of eosinophilia occurs in the majority of cases,[18] whereas this is the exception rather than the rule in psoriasis. In other instances the histologic changes in generalized neurodermatitis closely approximate those in localized neurodermatitis.

Contact dermatitis, which corresponds histopathologically to what early European writers termed "eczema," is characterized by parakeratosis, acanthosis and spongiosis. Contact dermatitis may result in vesicles in any layer of the epidermis. The histopathologic changes are quite distinct from those in the untreated lesions of psoriasis.

It is well known that distinction between certain types of seborrheic dermatitis and psoriasis with a seborrheic distribution of the lesions is often difficult.[19] When such distinction is difficult clinically, it may also be difficult histopathologically. Although there are generally accepted statements by various dermatologists that there is an increase in the lipid content in the stratum corneum in seborrheic dermatitis, one of us (H. M.)[20] has not found this to be true. The lipid content of the epidermis in both seborrheic dermatitis and psoriasis is minimal or absent. The histologic changes in the epidermis and papillary bodies in the two diseases may be indistinguishable except for the tortuosity, dilatation and apparent rigidity of the capillary vessels seen in psoriasis. In seborrheic dermatitis one may find microabscesses in the stratum corneum, but besides polymorphonuclear leukocytes, there usually are masses of cocci to be demonstrated, either in clumps or in chains. This applies especially to those forms of seborrheic dermatitis that Sabouraud, Mitchell and others have referred to as streptococcic dermatitis.

In dermatitis repens or acrodermatitis continua, there is great intracellular edema with ballooning of the cells in the so-called resistant framework of Kogoj. The infiltrate in the cutis in dermatitis repens is almost entirely composed of polymorphonuclear leukocytes in contrast to a lymphocytic infiltrate in psoriasis. Clumps of cocci are readily demonstrated in the abscesses in the stratum corneum in dermatitis repens; they are absent in microabscesses of psoriasis.

Recalcitrant pustular eruption (pustular bacterid) presents a more eczematoid reaction than psoriasis, as does also keratosis blennorrhagica and fungous infections of the palms and soles. In the last-mentioned lesions the fungi can be demonstrated histologically but more easily by studying preparati ns of skin in potassium hydroxide. Pompholyx presents large intraepidermal bullae without other features of psoriasis.

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17. MacCardle, R. C.; Engman, M. F., Jr., and Engman, M. F., Sr.: Histology of Neurodermatitis, Arch. Dermat. & Syph. **44**:161-189 (Aug.) 1941.

18. Burkhart, R. J., and Montgomery, H.: Dermatologic Significance of Tissue Eosinophilia, Arch. Dermat. & Syph., to be published.

19. Civatte, A.: Psoriasis and Seborrheic Eczema: Pathological Anatomy and Diagnostic Histology of the Two Dermatoses, Brit. J. Dermat. **36**:461-476 (Nov.) 1924.

20. Williams, H. L.; Montgomery, H., and Powell, W. N.: Dermatitis of the Ear, J. A. M. A. **113**:641-645 (Aug. 19) 1939.

Tertiary syphilids (psoriasiform syphilid) can be distinguished from psoriasis by characteristic plasma cell infiltrate with proliferative and obliterative changes in the walls of the vessels. Other diseases with which various types of psoriasis might be confused clinically need not be considered here, since their histologic changes are entirely different. In none of the cases studied in the series was there any question clinically or histologically of the transition to mycosis fungoides or another type of lymphoblastoma, nor was there any case in which epithelioma arose from a psoriatic lesion, although in several cases arsenical epitheliomas of the trunk or epitheliomas arising from arsenical keratoses were encountered.[21]

COMMENT

In the literature much space is devoted to the question of whether psoriasis begins primarily in the epidermis or in the cutis.[22] Even though we found in our study of early lesions that the first changes seemed to occur in the epidermis, this would not deny that epidermal changes may be secondary to transitory dilatation of the superficial vessels which is similar to that seen in urticaria and which cannot readily be demonstrated by the present methods of fixation of tissue. In the early lesions the epidermis over the papillary bodies remained of normal thickness, which suggested that the first changes in psoriasis resulted from proliferation of the rete ridges rather than that there was proliferation of the connective tissue with elongation of the papillary bodies and increased vascularity.

Kyrle,[22c] in his study of early psoriatic lesions, including subclinical lesions and especially those produced through the mechanism of Köbner's isomorphic irritant phenomenon, was able to find inclusion bodies resembling the Guarnieri bodies found in variola. Lipschütz,[23] Wlasscis [24] and, more recently, Finnerud [25] tended to support Kyrle's findings. Although we did not have specimens for biopsy from the subclinical lesions, in two specimens taken from lesions produced through Köbner's phenomenon and in many cases of early lesions of psoriasis we were unable to find any inclusion bodies resembling Guarnieri bodies. Thus we are in agreement with the majority of authors who have doubted the relationship of psoriasis to variola or to a virus disease. We might interject here that failure to demonstrate fungi or bacteria in any case of psoriasis also fits in with opinion in general that psoriasis is not on a bacterial or fungous basis.

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21. Montgomery, H., and Waisman, M.: Epithelioma Attributable to Arsenic, J. Invest. Dermat. **4**:365-380 (Oct.) 1941. Burgener, J.: Gibt es ein "echtes" Psoriasiskarzinom? Dermatologica **80**:86-97, 1939.

22. (*a*) Hebra, F.: On Diseases of the Skin, Including the Exanthemata, translated by C. H. Fagge and P. H. Pye-Smith, London, The Sydenham Society, 1868, vol. 2, p. 3. (*b*) Unna, P. G.: The Histopathology of the Diseases of the Skin, translated by N. Walker, New York, The Macmillan Company, 1896. (*c*) Kyrle, J.: Vorlesungen über Histo-Biologie der menschlichen Haut und ihrer Erkrankungen, Berlin, Julius Springer, 1925, vol. 1, p. 169; 1927, vol. 2, p. 266. (*d*) Duhring, L. A.: A Practical Treatise of Diseases of the Skin, ed. 3, Philadelphia, J. B. Lippincott Company, 1886, p. 309. (*e*) Kaposi, M.: Pathology and Treatment of Diseases of the Skin for Practitioners and Students, translated by J. C. Johnston, New York, William Wood & Company, 1895, p. 305. (*f*) Haslund, P.: Die Histologie und Pathogenese der Psoriasis, Arch. f. Dermat. u. Syph. **114**:427-492 and 745-814, 1913. (*g*) Heimann, W. J.: Histopathology: III. Scaling Inflammations of the Psoriasiform Type, J. Cutan. Dis. **34**:202 (March) 1916. (*h*) Margarot, J.: Psoriasis Vulgaris, in Darier, J., and others: Nouvelle pratique dermatologique, Paris, Masson & Cie, 1936, vol. 7, pp. 565-576. (*i*) Gans.[2] (*j*) Nobl.[10]

23. Lipschütz, B.: Untersuchungen über Psoriasis vulgaris, Arch. f. Dermat. u. Syph. **150**:195-212, 1926.

24. Wlassics, T.: Das Verhalten der verschiedenen einschlusskörperartigen Gebilde in psoriatischen Herden während der Behandlung, Arch. f. Dermat. u. Syph. **167**:185-191, 1933.

25. Finnerud, C. W., in discussion on MacKee and Foster,[26] p. 53.

Our observations from studying the fat content of psoriatic lesions of all different types in 25 cases are in accord with those of Gans,[2] MacKee and Foster [26] and others that there is no increase in lipids in the skin in psoriasis as Grütz [27] and Madden [28] would maintain. It is beyond the scope of this paper to consider treatment of psoriasis with lipocaic or other lipotropic substances.[29] On the basis of a limited experience in this regard together with our histologic observations, we are hesitant to regard psoriasis as a disturbance of lipid metabolism.

Madden,[28] and Kortanyshev[30] before him, found histologic changes suggestive of psoriasis in apparently normal skin of patients who had psoriasis. This would seem a logical phenomenon just as in disseminate forms of lupus erythematosus it is possible to recognize keratotic plugging and typical histopathologic changes before the clinical changes become diagnostic. Studies for this paper were completed before Madden's paper was published, and we did not have specimens for biopsy of subclinical psoriatic lesions for comparison. The majority of our specimens for biopsy, however, included normal skin adjacent to the psoriatic lesion in different types of psoriasis. There was no change to be found in this adjacent normal skin except in those cases in which treatment with ultraviolet radiation had been given to the psoriatic lesion. It was our experience that histologic involution of a psoriatic lesion paralleled the clinical improvement, as a rule, although at times lesions which clinically showed only residual pigmentation would still show histologic changes characteristic of psoriasis. After completion of our study in this series of cases of psoriasis, an excellent extensive article by MacCardle and the Engmans [17] on the histology of neurodermatitis appeared and has been followed by their interesting observations on the histologic spectrographic and microincineration studies in regard to neurodermatitis.[31] We have not had the opportunity of making spectrographic or microincineration studies in regard to either neurodermatitis or psoriasis.[32] Comparision of their histologic studies on localized or generalized neurodermatitis and on psoriasis with our studies is difficult, since they apparently depended on different types of fixatives and on Masson trichrome stain, which we employed in only a few cases. We are nevertheless in entire accord with their observation that it may be difficult to distinguish localized from generalized neurodermatitis and that the typical psoriatic lesion is readily distinguished histologically from neurodermatitis. Our experience, however, concurs with that of MacKee and Foster that aberrant forms of psoriasis exist which may be difficult to distinguish histologically from neurodermatitis.

In regard to the question of pigmentation in psoriasis and neurodermatitis, it is the belief of one of us (H. M.) after further studies with Kernohan [33] regarding

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26. MacKee, G. M., and Foster, P. D.: Histopathogenesis of Psoriasis and Its Aberrant Lesions, Arch. Dermat. & Syph. **34**:35-53 (July) 1936.

27. Grütz, O.: Neue histologische Beiträge zum Psoriasisproblem, Arch. f. Dermat. u. Syph. **177**:246-252, 1938.

28. Madden, J. F.: Histologic Studies of Uninvolved Skin of Patients with Psoriasis, Arch. Dermat. & Syph. **44**:655-664 (Oct.) 1941.

29. Gross, P., and Kesten, B.: Treatment of Psoriasis with Lipotropic Substances Derived from Foodstuffs, Arch. Dermat. & Syph. **47**:159-174 (Feb.) 1943.

30. Kortanyshev, A. I.: Histopathologic Character of Apparently Healthy Skin in Psoriatic Patients, abstracted, Arch. Dermat. & Syph. **40**:813 (Nov.) 1939.

31. Engman, M. F., Jr., and MacCardle, R. C.: New Approach to Problem of Disseminated Neurodermatitis, Arch. Dermat. & Syph. **46**:337-347 (Sept.) 1942.

32. MacCardle, R. C.; Engman, M. F., Jr., and Engman, M. F., Sr.: Mineral Changes in Neurodermatitis Revealed by Microincineration, Arch. Dermat. & Syph. **47**:335-372 (March) 1943.

33. Montgomery, H., and Kernohan, J. W.: Pigmented Nevi with Special Studies Regarding Possible Neuro-Epithelial Origin of the Nevus Cell, J. Invest. Dermat. **3**:465-491 (Dec.) 1940.

the neuroepithelial origin of nevi (in which study numerous fixatives and stains, including Masson's stain, were used) that Masson's *cellules claires* or clear cells are probably a variant of basal or dendritic cells and are not of neurogenous origin. If a silver nitrate stain for melanin is employed in a case of psoriasis, neurodermatitis or other acanthotic processes, one usually finds decrease in the melanin in the acute phases of the disease under consideration, melanin being deposited and phagocytosed in the cutis by chromatophores and at times also being extruded through the epidermis. The so-called clear cells as well as basal and dendritic cells may be lacking in pigment. The lack of melanin in active psoriatic lesions or other acanthotic processes is, however, we believe, only temporary. When a psoriatic lesion is undergoing treatment with ultraviolet radiation, one frequently finds increase in melanin in basal and dendritic and clear cells in the epidermis and granules of melanin throughout the epidermis. On involution of a psoriatic lesion, even without treatment with ultraviolet radiation, there may be a residual increased melanin pigmentation. Conversely, in other acanthotic hyperkeratotic diseases, such as acanthosis nigricans, there is a greatly increased formation of melanin despite acanthosis and hyperkeratosis. It would seem to us unlikely that there is a definite relation between pigmentation and keratinization as suggested by MacCardle and his associates.[17]

SUMMARY AND CONCLUSIONS

The histologic changes in various types of psoriasis from the earliest lesions to active, latent and clearing lesions and the effects of treatment of lesions with ultraviolet radiation and crude coal tar have been described. The histologic changes in the various stages differ considerably.

The histologic picture of psoriasis is usually diagnostic if a well developed, fairly recent papular plaque is selected for biopsy. More severe and exudative types of psoriasis are encountered clinically and histologically in relation to psoriatic arthritis, erythroderma psoriaticum and so-called pustular psoriasis and call for careful selection of the site of biopsy in order to arrive at the correct diagnosis. The histologic changes in exfoliative dermatitis due to psoriasis (erythroderma psoriaticum) remain typically those of psoriasis. After treatment by ultraviolet radiation and crude coal tar ointment, the histologic involution of a lesion usually parallels the clinical involution.

It may be difficult to distinguish indolent plaques of psoriasis histologically from localized neurodermatitis and sometimes from generalized neurodermatitis and certain types of seborrheic dermatitis. Criteria for histologic differentiation between these diseases are given, as well as distinction between pustular psoriasis, dermatitis repens, recalcitrant pustular eruption and other diseases with which psoriasis may be confused.

Our studies would suggest that the first changes in psoriasis occur in the epidermis. We were unable to demonstrate Guarnieri-like bodies or find evidence that a virus was an etiologic factor. There was no increase in lipid content of the skin. We failed to find histologic evidence of psoriasis in normal skin adjacent to the psoriatic lesions, but specimens for biopsy were not taken from subclinical lesions at a distance from a psoriatic lesion. We found decrease in formation of melanin pigment in active lesions in psoriasis but no permanent disturbance in the formation of melanin of the pigment cells in the epidermis.

There was no evidence in this series that psoriasis might eventuate in any type of lymphoblastoma or that lesions of psoriasis might eventuate in epithelioma.

BUBONULUS IN GRANULOMA INGUINALE

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AND
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Bubonulus is the term applied to a lymphangitic abscess which occasionally occurs in chancroidal infection and lymphogranuloma venereum. It is important to note that this lesion occurs along the course of a lymphatic vessel in a location where no lymph glands are present. At times suppuration occurs simulating a bubo. In 1940, Brandt [1] reported 3 cases of lymphogranuloma venereum in which bubonuli were present. Somewhat similar lesions have also been described as occurring in tuberculosis and in tularemia.[1]

The usual concept of granuloma inguinale is that it is a disease which involves the skin alone and spares the lymphatic system. In rare instances involvement of the lymph nodes by way of the regional lymphatic drainage has been reported.[2] However, to our knowledge true bubonuli have not been reported in granuloma inguinale. In our clinic a considerable number of patients with granuloma inguinale have been treated, but lymphatic involvement had not been observed until the following case came to our attention.

REPORT OF A CASE

S. H., a Negro aged 20, was referred to our clinic for diagnosis and treatment on Jan. 20, 1943. He had noticed small "pimples" appearing on the penis three weeks earlier. These gradually became larger and formed painless "sores."

Physical Examination.—The prepuce appeared greatly swollen and showed two sharply defined bright red granulomatous lesions, each 2 cm. in diameter (fig., *a*) and 4 mm. apart. Two other similar but smaller areas were present: one in the right inguinal region (fig., *b*) and the other just above the corona on the dorsum of the penis (fig., *c*). From the upper border of the latter lesion and extending upward almost to the middle of the penis, there was a soft, fluctuant, practically painless subcutaneous abscess (fig., *d*). At the root of the penis on its dorsum and extending upward about 3 cm., there was a plum-sized similar abscess (fig., *e*). At its lower border, near the root of the penis, there was a granuloma 2.5 cm. in diameter which showed a necrotic central area (fig., *f*). On pressure over both abscesses, a thin yellowish pus was expressed which appeared on the surfaces of the ulcers below. There was thus a definite subcutaneous burrowing of the abscesses which communicated with the adjacent ulcerations.

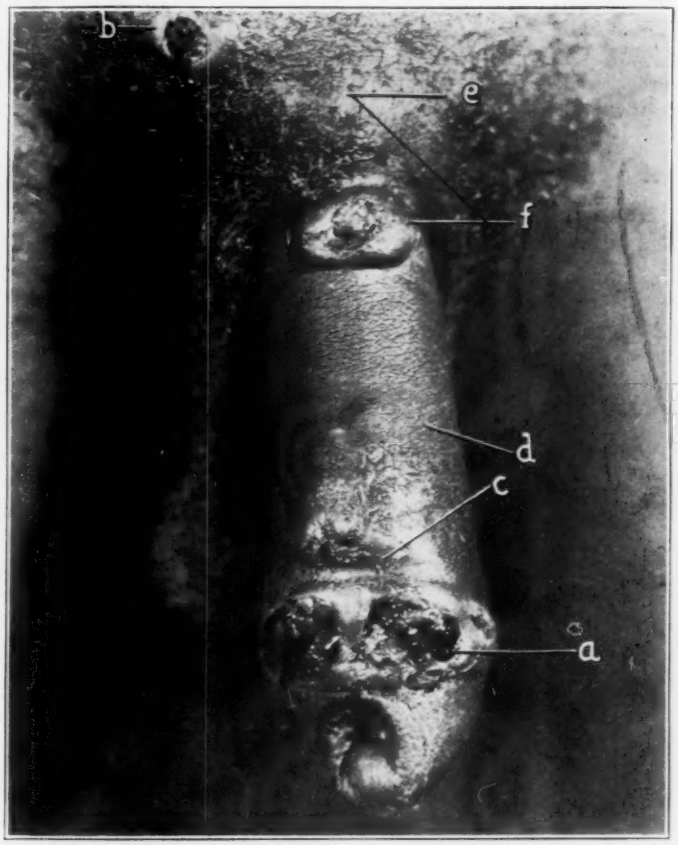
Results of Laboratory Examinations and Diagnostic Tests.—With the Wright stain, Donovan bodies in large numbers were easily demonstrated in the pus obtained from the abscesses and also in scrapings from the granulomatous tissue in the other lesions. Stained smears from the pus did not show Haemophilis ducreyii or other bacteria, such as staphylococci or streptococci. Repeated dark field examinations did not reveal Spirochaeta pallida. Wassermann reactions of the blood, determined on three specimens taken during a period of two months, were negative. Intradermal tests for lymphogranuloma venereum with both human and chick embryo Frei antigens and intradermal test for chancroid utilizing H. ducreyii vaccine all gave negative reactions.

From the Central Clinic, Bureau of Social Hygiene, Department of Health, New York.

1. Brandt, R.: "Bubonulus" in Lymphogranuloma Venereum, Arch. Dermat. & Syph. **42**:811 (Nov.) 1940.

2. Mayer, M., and da Rocha Lima, H.: Venerisches Granulom, in Arndt, G., and others: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1927, vol. 21, p. 433.

Course.—One week after the patient's admission to the clinic, the inguinal glands, which were previously noted as being of the size of a small pea, became moderately enlarged but were not tender on pressure and did not suppurate. During the first week, the patient took 14 Gm. of sulfathiazole in divided doses, to observe any possible therapeutic effect on the lesions. This did not in any way change the clinical picture. After this, he was given intravenous injections of a 1 per cent aqueous solution of antimony and potassium tartrate in 5 cc. doses three times a week. There was a rapid involution of all the lesions, with healing of the abscesses and subsidence of the adenitis. After seventeen intravenous injections over a period of twelve weeks, the lesions were almost completely epithelialized.



Granuloma inguinale of three weeks' duration, showing multiple eroded and granulomatous areas on the shaft of the penis and the symphysis pubis, lymphangitis and bubonuli at the root of the penis and on the shaft and bilateral inguinal adenitis.

COMMENT

In granuloma inguinale the sites of predilection are the genitocrural and genitoanal regions. Occasionally, however, the genitals as well as other sites are affected.

To physicians who are accustomed to see the "raw beef" appearance of the chronic lesions of granuloma inguinale, it may be surprising to learn that the earliest manifestations of the disease are small vesicles, pustules or furuncle-like small lesions.[2] As these lesions develop, they break down the skin to form bright red, soft, spongy, granulating areas which become confluent and slowly spread peripherally. These granulomatous areas often rise above the level of the skin.

Sutton and Sutton [3] stated that "there is no formation of abscesses at any time" in granuloma inguinale. However, in rare cases it has been observed that the lymphatic system was involved, as evidenced by adenitis of the adjacent lymph glands. These formed bubos which ulcerated and later became granulomatous.

It is interesting to note that in our case not only was there bilateral inguinal adenitis but that along the lymph vessels of the dorsum of the penis there were two fluctuant abscesses, proved to be due to the etiologic agent of granuloma inguinale. It may be assumed that these two abscesses which appeared along the dorsal lymphatics began as lymphangitic infiltrations. In confirmation, it should be noted that the regional inguinal glands were also affected by extension of the process through the lymphatics. The lack of response to sulfathiazole therapy and the negative results of tests for chancroid and lymphogranuloma venereum practically exclude these diseases. The rapid response to antimony and potassium tartrate therapy is also in favor of this conclusion.

CONCLUSIONS

Granuloma inguinale is a disease which is limited, almost always, to the skin and does not as a rule affect the lymphatic system. Nevertheless, in rare instances, it may involve the lymphatics. The case herein reported illustrates this well. It is probable that in very early cases, carefully observed, a higher incidence of lymphatic involvement with bubonuli might be found.

Dr. Borris Kornblith made suggestions in this case.

124 East Fortieth Street, New York.
2167 Eighty-First Street, Brooklyn.

3. Sutton, R. L., and Sutton, R. L., Jr.: Diseases of the Skin, ed. 10, St. Louis, C. V. Mosby Company, 1939, p. 1291.

INHIBITORY EFFECT OF MONOCHLORMERCURICARVACROL ON GROWTH OF PATHOGENIC FUNGI

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Many chemicals, inorganic as well as organic compounds, have been suggested as fungistatic and fungicidal agents for the treatment of dermatophytoses commonly referred to as "athlete's foot." The inorganic compounds usually are oxidizing agents (potassium permanganate, iodine, chlorine), acids (boric) or salts of heavy metals (zinc, lead, titanium). The organic compounds recommended have been dyes, organic acids, volatile oils and certain terpene derivatives. The dyes function primarily as bacteriostatic agents; among them are carbolfuchsin and gentian violet. Benzoic and salicylic acids are among the organic acids most frequently employed in ointments. Their copper salts have been reported by Barry, Hartung and Grubb [1] to be inferior to the free acids. Clove and cinnamon oils have been recommended; Maplestone,[2] however, cautioned against their use because of great variation in fungistatic activity of different batches. Camphor, menthol and thymol are volatile substances which are incorporated in preparations designed to arrest the growth of pathogenic fungi associated with eczematous ringworm of the feet. Halogen derivatives of thymol and carvacrol have been reported to act selectively on gram-positive bacteria by Kojima [3]; no mention was made of their effect on fungi.

Relatively few mercuriated compounds have been used, perhaps because of the danger of mercury poisoning involved in treatment of acute vesicular lesions. Ammoniated mercury has been suggested by several persons who contributed to the symposium led by Epstein.[4] Burt [5] found that mercuriated derivatives of thymol and carvacrol retain their phenolic character and at the same time contain a rather high percentage of mercury. For this reason it was decided to determine what effect mercuriated carvacrol would have on epidermophyton, trichophyton, monilia and Staphylococcus aureus in vitro. Carvacrol and its derivatives have not been mentioned in the literature, but a compound isomeric with it, thymol, has been referred to frequently.

MATERIALS AND METHODS

A. *Cultures.*—The following five fungi,[6] known to be associated with and commonly considered the causative organisms of dermatophytosis of the feet, were employed in these studies:

From the department of bacteriology, University of Nebraska.

1. Barry, R. H.; Hartung, W. H., and Grubb, T. C.: The Action of Some Organo-Mercurials and Some Copper Salts on Ringworm Fungi, J. Am. Pharm. A. (Scient. Ed.) **31**: 43-45, 1942.

2. Maplestone, P. A.: Laboratory Tests on the Fungistatic and Fungicidal Effect of Various Substances, Indian J. M. Research **25**:603-615, 1938.

3. Kojima, K.: Theory and Practice of the Bactericidal Action of Various Kinds of Disinfectants, Jap. J. Exper. Med. **18**:439-441, 1940.

4. Epstein, E.; Lewis, G. M.; Loveman, A. B.; Pillsbury, D. M.; Schoch, A. G.; Shelmire, B.; Smith, D. C.; Swartz, H. H., and Wieder, L. M.: II. Symposium on the Practical Management of Eczematous Ringworm of the Hands and Feet ("Athlete's Foot"—Dermatophytoses and Dermatophytids), J. Invest. Dermat. **3**:523-562, 1940.

5. Burt, J. B.: Some Mercuriated Derivatives of Thymol and Carvacrol, J. Am. Pharm. A. (Scient. Ed.) **25**:112-117, 1936.

6. Cultures bearing strain numbers were obtained from the American Type Culture Collection. The remaining strains were contributed by Miss E. Burglingame, of St. Louis

Epidermophyton inguinale, strain 654 A. T. C. C.; Epidermophyton interdigitale, strain 7190 A. T. C. C.; Trichophyton gypseum; Trichophyton purpureum, and Trichophyton rosaceum, strain 659 A. T. C. C.

For purposes of comparison it was deemed desirable to observe the action of test compounds on pathogenic yeast [7] encountered in blastomycetic dermatitis. That yeasts may be associated with Epidermophyton and Trichophyton in multiple fungous infections is found in the report by Lewis and Hopper.[8] Representatives of such yeasts are Monilia albicans and Monilia candida.

To complete the survey, a bacterium, Staph. aureus, commonly found on the surface of the skin, was included in these studies because it is frequently associated with complications of dermatophytosis. The culture is the Food and Drug Administration strain maintained in the University of Nebraska stock culture collection and used in the standardization of disinfectants.

The fungi were cultivated on slants of Sabouraud's medium and transferred every two weeks in order to maintain them in a high state of viability; storage was at room temperature. For preparation of inoculums, subcultures were made on Sabouraud's agar, and after five to seven days' incubation (28 to 30 C.) enough sterile water was added to each tube to cover the entire slant. The growth was suspended by agitation with a sterile cotton pledget until the liquid became turbid. The suspension was then streaked uniformly over the surface of agar plates by means of the same cotton swab.

Monilia was also carried on Sabouraud slants and the stock cultures transferred weekly. For test purposes, twenty-four hour cultures incubated at 30 C were used. Suspensions were made and transferred to other surfaces in the manner described.

Staph. aureus was transferred weekly on slants of nutrient agar. For test purposes, twenty-four hour transfers on agar incubated at 37 C. were emulsified in the manner outlined for the fungi.

B. *Mediums.*

1. Sabouraud Agar (for the Growth of the Fungi)

Peptone (Bacto)	1.0 Gm.
Maltose (Difco)	4.0 Gm.
Agar (Bacto)	2.0 Gm.
Distilled water	100.0 cc.

Sterilization was effected by autoclaving at a pressure of 15 pounds (6.8 Kg.) for twenty minutes. The hydrogen ion concentration was adjusted whenever necessary to p_H 6.5 before sterilization.

When serum was incorporated into the medium, it was added aseptically just before plating to melted, cooled (45 C.) Sabouraud agar and mixed thoroughly. Serum from horse blood was used in such amounts that the final concentration in the medium was 10 per cent. The blood was freshly drawn and immediately defribinated.

2. Nutrient Agar (for the Growth of Staph. Aureus)

Peptone (Bacto)	0.5 Gm.
Beef extract (Bacto)	0.3 Gm.
Agar (Bacto)	1.5 Gm.
Distilled water	100.0 cc.

The p_H was adjusted to 6.8 to 7.0 when necessary and the mediums sterilized in the usual manner.

C. *Technics.*

1. Fungistatic Tests:

(*a*) Preparation of agar plates. The agar cup plate method outlined by Ruehle and Brewer,[9] as modified by Burlingame and Reddish [10] for use with fungi, was employed throughout the study. Sabouraud agar was used for the fungi and nutrient agar for the bacterium.

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7. These strains were made available by Dr. M. Starr Nichols, of the State of Wisconsin Hygienic Laboratory, Madison, Wis.

8. Lewis, G. M., and Hopper, M. E.: Concurrent, Combined and Consecutive Fungous Infections of the Skin: Cultural Experiences, Arch. Dermat. & Syph. **47**:27-35 (Jan.) 1943.

9. Ruehle, G. L. A., and Brewer, C. M.: United States Food and Drug Administration Methods of Testing Antiseptics and Disinfectants, Circular 198, United States Department of Agriculture, December 1931.

10. Burlingame, E. M., and Reddish, G. F.: Laboratory Methods for Testing Fungicides Used in the Treatment of Epidermophytosis, J. Lab. & Clin. Med. **24**:765-772, 1939.

Thirty-five cubic centimeters of medium was introduced into each Petri dish. This amount prevented excessive shrinkage of the mediums during the long incubation period and also permitted deep cores for cups, thus accommodating 0.5 cc. quantities of test material.

The Petri dishes were equipped with porous clay tops to permit incubation with the surface of the medium in an upward position without having water of condensation introduce a spreading error over the zones of inhibition. Porous clay tops are preferred to glass covers, since the former allow adequate aeration of the culture and likewise permit volatile substances present in test mixtures to pass off into the surrounding atmosphere.

Liquids were transferred aseptically to the cup by means of sterile pipets, whereas ointments were warmed to a point where they could be drawn into sterile, warm pipets and then transferred. Five-tenths cubic centimeter quantities of each were used in these investigations. Dusting powders were tested by impregnating a sterile disk of surgical gauze (type 1) 11 mm. in diameter, removing the excess powder and transferring the disk with sterile forceps to an inoculated agar plate. The need for standardizing the thickness of the pour plate, the p_H of the medium, the concentration of agar and the amount of antiseptic used for testing purposes has been outlined by Rose and Miller.[11]

(*b*) Inoculation. The method of seeding the plates consisted of swabbing the entire surface of the freshly poured agar with a cotton pledget saturated with an aqueous suspension of the test organism. Care was exercised in distributing the inoculum uniformly over the entire surface of the plate.

Pour plates and streak plates were employed for cultures both of the pathogenic yeasts and of the bacterium.

The temperature of incubation for the fungi was 28 C., while that for Staph. aureus was 37.5 C.

(*c*) Controls. Uninoculated controls were carried along simultaneously (1) to check the sterility of the Petri dishes, medium and blood and (2) to determine the inhibitory action, if any, of the various ointment bases from which the test compound was omitted. Inoculated controls were also made in order to determine the viability of the test culture.

(*d*) Observations. The fungi were observed daily, with final readings made between the fifth and the seventh day. The yeast and bacterial cultures, because of their rapid growth, were observed at forty-eight hours.

The zones of inhibition were measured with draftsman's dividers. Three measurements were made for each zone and an average recorded. The zone of inhibition was considered the distance from the periphery of the agar cup to the first visible sign of growth. The data are reported also as areas in terms of square centimeters in which no growth occurred.

(*e*) Replicates. Each investigation recorded in the following tables represents average results obtained from triplicate experiments.

2. Fungicidal Tests

Fungicidal tests were conducted on several liquid preparations. The method of Klarmann, Shternov and Costigan[12] was employed. Briefly, it consists of growing the test organism, T. rosaceum, in Sabouraud broth for ten days at 28 C. The fungal growth was dispersed by shaking with sterile glass beads and then passing through a sterile 200 mesh monel metal sieve. The spore suspension was standardized at 1,500,000 spores per cubic centimeter.

Five-tenths cubic centimeter of the standardized inoculum was transferred to 5 cc. of the fungicidal solution held at 20 C. Subcultures were made at one, five and ten minutes to Sabouraud broth and Sabouraud agar slants. Growth was recorded after incubation at 28 C. for ten days. Comparison was made with a standard phenol solution.

Solutions recommended for foot baths should destroy the test fungus in one minute. For rendering inanimate objects free of pathogenic fungi, the test compound must destroy in ten minutes.[13]

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11. Rose, S. B., and Miller, R. E.: Studies with the Agar Cup-Plate Method: I. A Standardized Agar Cup-Plate Technique, J. Bact. **38**:525-537, 1939.

12. Klarmann, E. G.; Shternov, V. A., and Costigan, S. M.: A Method for the Evaluation of Water Soluble and Water Miscible Fungicides Used in the Prevention of the Spread of "Athlete's Foot," J. Bact. **42**:225-229, 1941.

13. Epstein, S. D.: Athlete's Foot: A Discussion of Its Occurrence, Prevention, Control and Test Methods, Soap & Sanit. Chem. **17**:94-95, 97, 99 and 109, 1941.

D. *Test Compounds.*[14]

1. In selecting compounds deemed worthy of detailed study from the immense numbers which are of possible application, I was guided by the work of others, particularly that reported by Epstein and co-workers [4] and Peck and Schwartz.[15] Various recommendations have been made as a result of clinical observations: e. g., use of ointment of benzoic and salicylic acid N. F. (Whitfield's ointment) for dry, subacute chronic infections, alcohol lotions for moist, subacute chronic infections and powders for the milder dermatophytoses.

2. Ointments:

(*a*) Monochlormercuricarvacrol,[16] 1 per cent in an ointment base

(*b*) Monochlormercuricarvacrol, 1 per cent in a soluble base

(*c*) Ointment of benzoic and salicylic acid N. F.

Salicylic acid	6.0 per cent
Benzoic acid	12.0 per cent
Ointment base	

(*d*)

Salicylic acid	3.0 per cent
Benzoic acid	6.0 per cent
Thymol	1.5 per cent
Soluble base	

(*e*)

Monochlormercuricarvacrol	1.5 per cent
Salicylic acid	3.0 per cent
Benzoic acid	6.0 per cent
Soluble base	

(*f*) Carvacrol, 1.5 per cent in a soluble base

(*g*)

Sulfathiazole	10.0 per cent
Chlorobutanol	1.0 per cent
Soluble base	

Ointment Base		Soluble Base	
White petrolatum	97.0 per cent	Glycerin monostearate	10.0 per cent
Hydrous wool fat	2.0 per cent	Glycerin	20.0 per cent
		Bentonite	2.0 per cent
		Water	67.0 per cent

3. Liquids and Eutectic Mixtures:

(*h*)

Phenol U. S. P.	50.0 per cent
Camphor	50.0 per cent

(*i*)

Salicylic acid	8.0 per cent
Ethyl alcohol (70 per cent)	92.0 per cent

(*j*) Saturated aqueous solution:

Monochlormercuricarvacrol	4.40 mg.
Salicylic acid	0.28 Gm.
Benzoic acid	0.27 Gm.
Distilled water (the p_H of this solution is 2.45)	100.00 cc.

(*k*) Tincture:

Monochlormercuricarvacrol	1.60 Gm.
Salicylic acid	3.0 Gm.
Benzoic acid	6.0 Gm.
Isopropyl alcohol (91 per cent) (the p_H of this solution is 3.1)	100.0 cc.

4. Solids:

(*l*) Monochlormercuricarvacrol, 1.0 per cent, in a bentonite base.

EXPERIMENTAL RESULTS

A. Effect of Hydrophilic and Ointment Bases.

14. These preparations were made available through Dr. F. S. Bukey, of the Smith-Dorsey Company, Lincoln, Neb. Preparation "e" under "Ointments" is marketed under the trade name of "carvasal."

15. Peck, S. M., and Schwartz, L.: A Practical Plan for the Treatment of Superficial Fungus Infections, Pub. Health Rep. **58**:337-345, 1943.

16. Melting point 183.5 to 184 C.; Hg. 52.06 per cent; solubility 4.4 mg. per hundred cubic centimeters of water at 25 C.

Foley and Lee [17] have demonstrated that ointment (fat) bases tend to reduce the bacteriostatic activity of many substances. Attempts were made to determine whether a petrolatum base, such as is commonly employed in pharmaceutic practice, might reduce the inhibitory action of chlormercuricarvacrol. Compared with it was a hydrophilic base. The formulas for both are found under "Test Compounds—2."

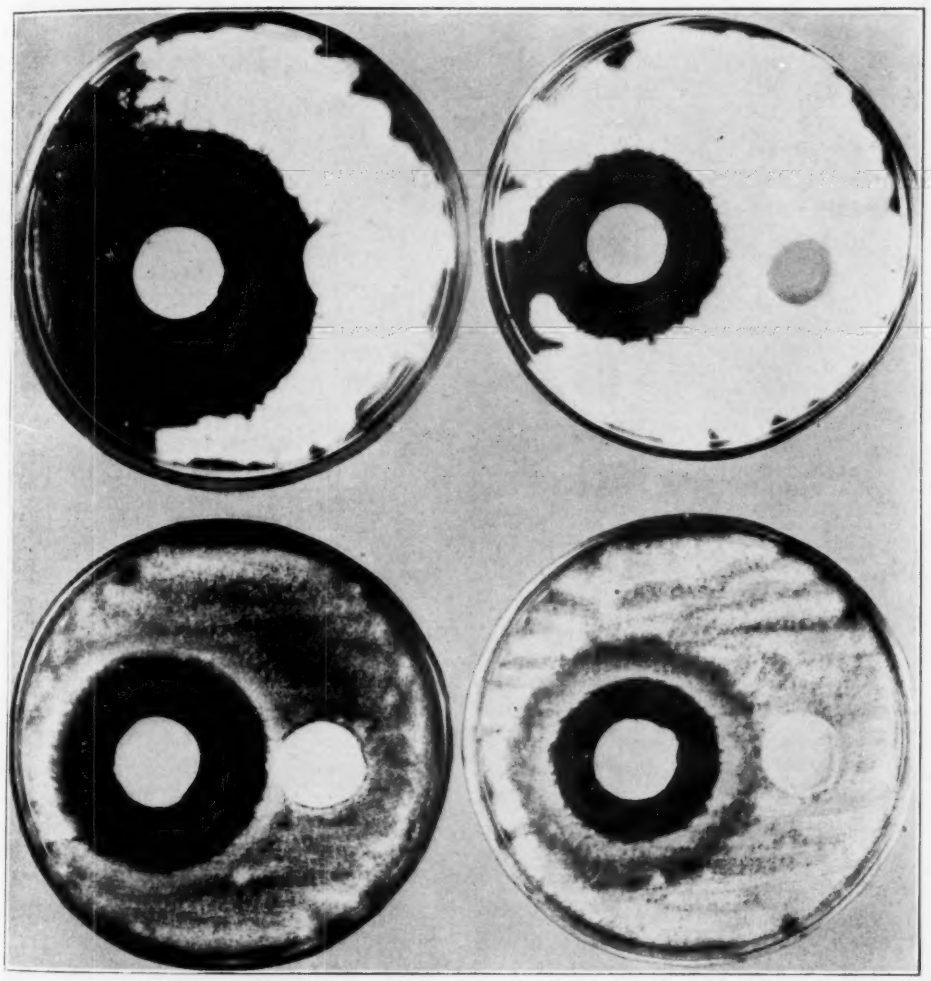

Fig. 1.—Effect of hydrophilic and petrolatum bases on the size of the zone of inhibition on pathogenic fungi in the presence of 1 per cent monochlormercuricarvacrol. Top row: E. interdigitale—left, hydrophilic base; right, petrolatum base. Bottom row: T. rosaceum—left, hydrophilic base; right, petrolatum base. The disk on the right side of each plate is a control, consisting of the ointment base minus the inhibitory agent.

In figure 1 are reproduced plates of two of the five pathogenic moldlike fungi studied. The remaining three responded similarly, as indicated in table 1, which contains data relating to the degree of reduction of zones of inhibition.

17. Foley, E., and Lee, C. O.: A Study of Antiseptics in Various Ointment Bases, J. Am. Pharm. A. (Scient. Ed.) **31**:105-108, 1942.

B. Effect of Serum.

The presence of serum is known to retard the inhibitory action of fungicidal and fungistatic agents. To determine the extent of reduction, 10 per cent horse serum was added aseptically to cooled (45 C.), melted Sabouraud agar just prior to plating. The method of Ruehle and Brewer [9] was followed.

In figures 2 and 3 the bottom rows illustrate the differences in the size of the zone of inhibition in the presence and absence of serum. The difference is more striking with E. interdigitale than it is with T. rosaceum. The effect on monilia is recorded in figure 4.

Data for the other fungi and Staph. aureus may be found in figures 5 and 6.

C. Composition and Comparison of Preparations.

In a recent paper by Peck and Schwartz [15] and a symposium led by Epstein,[4] a large number of preparations containing various inhibitory agents were reported as a result of widespread clinical experience. Formulas for ointments (hydrophilic and grease bases), liquids and powders were listed and their application recommended for dermatophytoses in various states, viz., dry or moist, subacute or chronic, mild or severe, etc.

TABLE 1.—*Effect of Petrolatum Base on Reduction of Zone of Inhibition*

Organism	1% Monochlormercuricarvacrol	
	Hydrophilic Base Without Serum (*b*), Mm.*	Petrolatum Base Without Serum (*a*), Mm.*
E. inguinale	18.0	11.0
E. interdigitale	17.0	10.5
T. purpureum	15.0	9.5
T. rosaceum	12.0	8.5
T. gypseum	16.0	9.0
M. albicans	8.0	6.0
M. candida	6.5	3.0
Staph. aureus	11.0	5.5

* Distance in millimeters represents average distance from edge of cup to area of visible growth.

Several representative ointments were selected, primarily because of their popularity as based on the two citations referred to previously. The oldest and most frequently employed for routine application is half-strength ointment of benzoic and salicylic acid N. F. in a petrolatum base. Fungistatic activity of this ointment (*c*) is illustrated in the center row of figures 2 and 3 and recorded graphically for comparison with that of various species of filamentous fungi, yeasts and Staph. aureus in figures 5 and 6. The percentage reduction of the zone of inhibition between serum plates and plain Sabouraud agar (hydrophilic base ointments) was of the order of 33 to 62 per cent for the molds, 50 to 66 per cent for the yeasts and 40 per cent for the bacterium.

Thymol is known to be a fungistatic agent and has been incorporated in half-strength ointment of benzoic and salicylic acid N. F.[4] Slightly greater zones of inhibition were recorded when glass-covered Petri dishes were used with the preparation (*d*) containing thymol, benzoic and salicylic acids than when clay tops were employed. This was to be expected, since the volatile thymol can diffuse through the porous clay tops; in this manner, one simulates a condition under which preparations would be used clinically; i. e., they would not be employed under air-tight circumstances as they are with glass-topped Petri dishes. Fungistatic action of this preparation compared with that of others may be found in the top row of figure 2, in the center row of figure 3 and again in figures 5 and 6. Reduction due to the presence of serum is 21 to 51 per cent for Epidermophyton and Trichophyton, 4 to 14 per cent for monilia and 11 per cent for Staph. aureus.

Sulfathiazole has been reported by Rademacher [18] to be effective in the treatment of fungous infections of the feet. Laboratory tests conducted according to the method of Ruehle and Brewer [9] indicate that there is no fungistatic activity demonstrable. This is in agreement with observations by Dimond and Thompson,[19] who attributed the negative results to the antisulfonamide effect of paraaminobenzoic acid which is present in the peptone fraction of the Sabouraud agar. The plate on the right of figure 2 in the top row is typical of its activity in vitro; slight

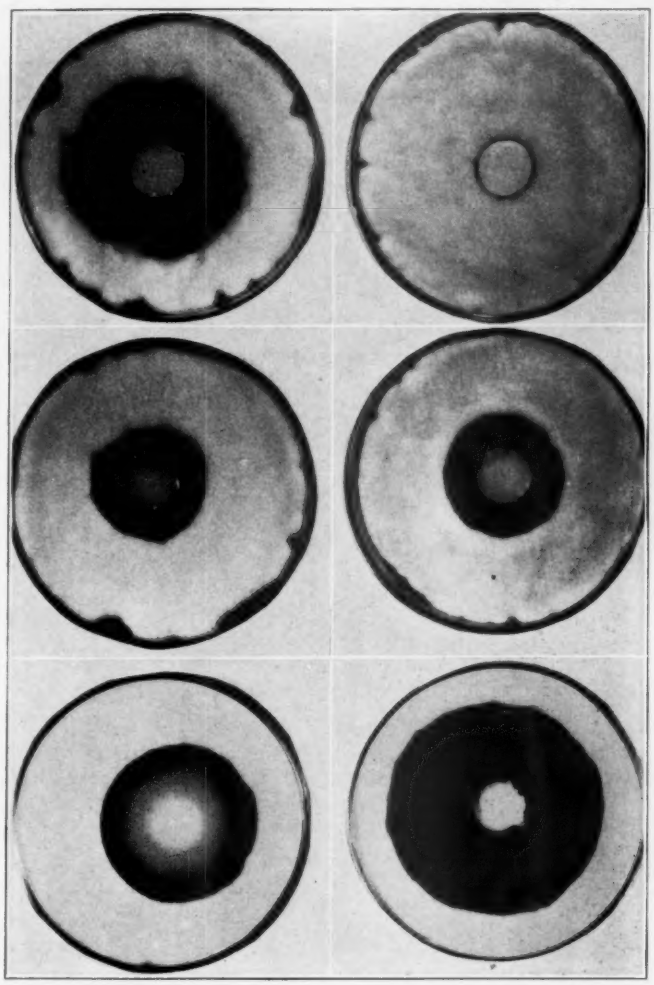

Fig. 2.—Effect of various inhibitory agents on the growth of E. interdigitale in the presence of 10 per cent serum. Top row: left, benzoic and salicylic acids + thymol (*d*); right, sulfathiazole (*g*). Center row: left, ointment of benzoic and salicylic acid N. F. (*c*); right, monochlormercuricarvacrol (*b*). Bottom row: benzoic and salicylic acids + monochlormercuricarvacrol (*e*); left, + 10 per cent serum; right, without serum.

18. Rademacher, C. J.: Treatment of Trichophyton Foot Infections in the Field, Mil. Surgeon **90**:431-434, 1942.

19. Dimond, N. S., and Thompson, K. W.: The Effect of Sulfonamide Drugs on Trichphytons in Vitro, J. Invest. Dermat. **5**:397-402, 1942.

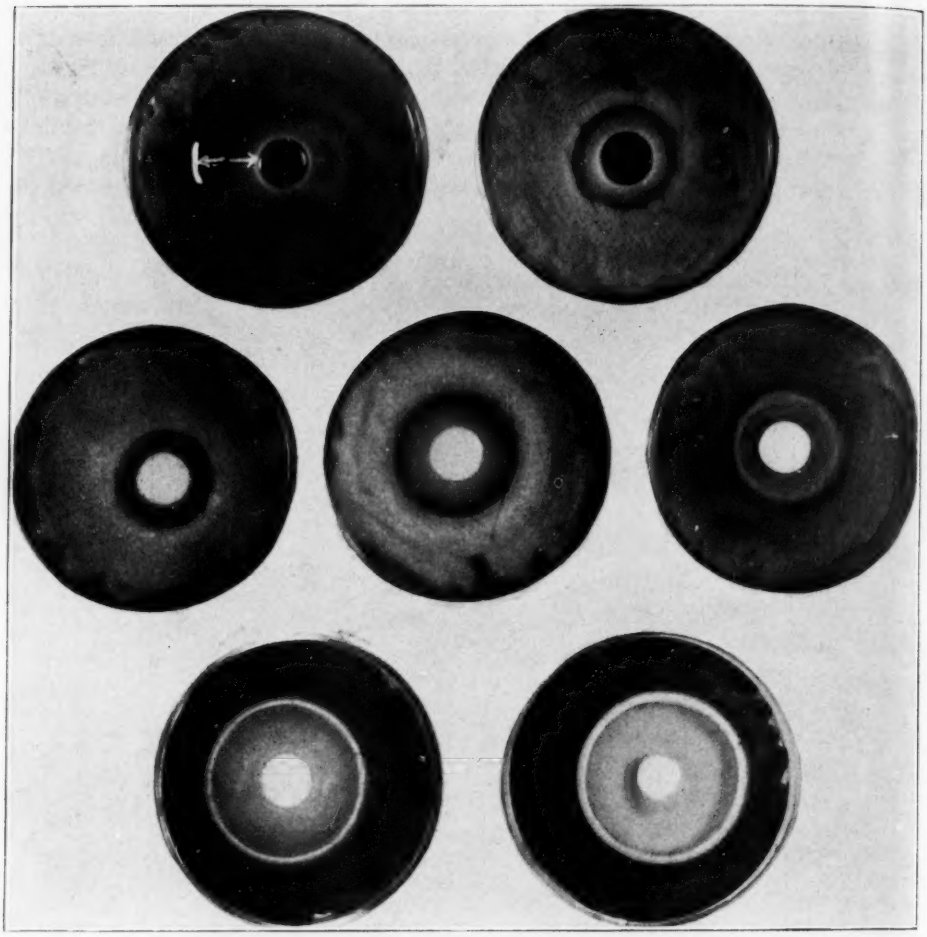

Fig. 3.—Effect of various inhibitory agents on the growth of T. rosaceum in the presence of 10 per cent serum. Top row: left, phenol + camphor (*h*); right, salicylic acid in ethyl alcohol (*i*). Center row: left, ointment of benzoic and salicylic acid N. F. (*c*); center, benzoic and salicylic acids + thymol (*d*); right, monochlormercuricarvacrol (*b*). Bottom row: benzoic and salicylic acids + monochlormercuricarvacrol (*e*); left, + 10 per cent serum; right, without serum.

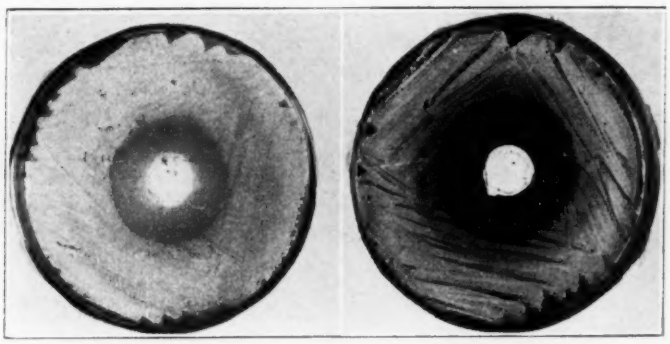

Fig. 4.—Effect of various inhibitory agents on the growth of M. albicans in the presence of benzoic and salicylic acids + monochlormercuricarvacrol (*e*). Left: + 10 per cent serum; right, without serum.

inhibition was exhibited toward Staph. aureus in nutrient agar to which no serum was added.

The striking structural similarity of carvacrol to thymol led Burt [5] to mercurialize the former. Monochlormercuricarvacrol retains the phenolic character of carvacrol and at the same time contains a high percentage of mercury. Other mercurials, such as ammoniated mercury, have been employed in the treatment of dermato-

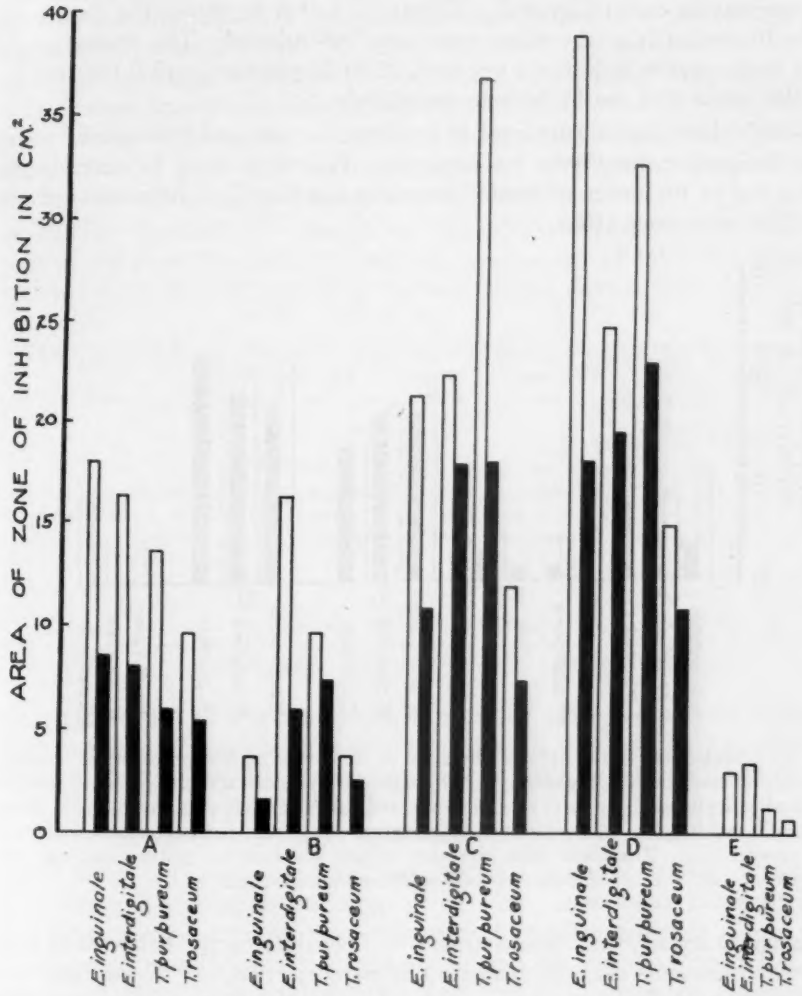

Fig. 5.—Comparison of the area of the zone of inhibition of five preparations (Epidermophyton and Trichophyton used as test organisms). *A*, monochlormercuricarvacrol (*b*); *B*, ointment of benzoic and salicylic acid N. F. (*c*); *C*, benzoic and salicylic acids plus thymol (*d*); *D*, benzoic and salicylic acids plus monochlormercuricarvacrol (*e*); *E*, monochlormercuricarvacrol in dusting powder (*l*). The clear bars represent results obtained on culture mediums not containing serum, and the black bars, on mediums containing serum.

phytoses (Barry, Hartung and Grubb [1] and Dunn [20]). Comparison of the fungistatic effect of an ointment (*e*, hydrophilic base) consisting of monochlor-

20. Dunn, C. G.: Fungicidal Properties of Sec-Amyltricresol, Orthohydroxyphenylmercuric Chloride and a Mixture of the Two, J. Infect. Dis. **61**:31-36, 1937.

mercuricarvacrol and benzoic and salicylic acids are recorded photographically in the bottom rows of figures 2 and 3 and in figure 4. The effect of serum in reducing the zone of inhibition is noticeable, the reduction being less with T. rosaceum than with E. interdigitale. The combination of mercury with the blood proteins is evidenced by the halo effect visible around the cup. Attention should be called to the fact that the plates in the bottom row of figure 3 were photographed on a white background; this accounts for the white zone of inhibition and the darkened areas representing cultural growth. Figures 5 and 6 represent the data, in graph form, for the majority of the micro-organisms investigated. The percentage reduction due to the serum is 25 to 53 per cent, 11 to 22 per cent, and 0 per cent for the molds, the yeasts and the bacterium respectively.

Although the odor of carvacrol is apparent in year-old hydrophilic ointments (*e*), the fungistatic activity is not impaired. Carvacrol itself is somewhat fungistatic but not of the order of monochlormercuricarvacrol. The acetoxy derivative was without inhibitory effect.

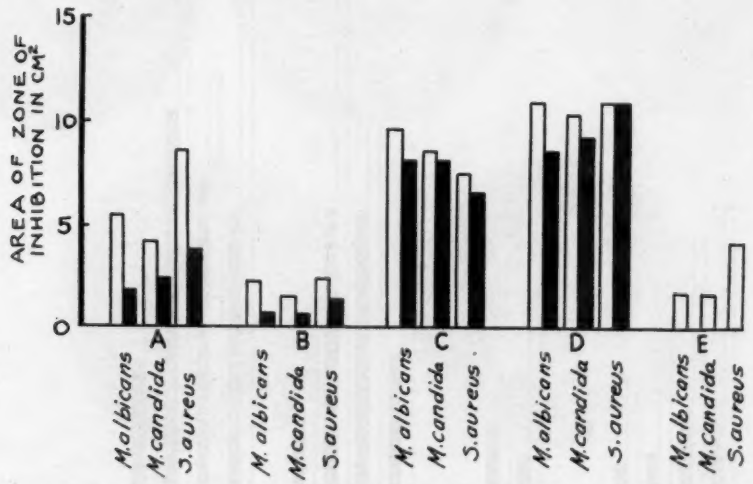

Fig. 6.—Comparison of the area of the zone of inhibition of five preparations (monilia and Staph. aureus used as test organisms). *A*, monochlormercuricarvacrol (*b*); *B*, ointment of benzoic and salicylic acid N. F. (*c*); *C*, benzoic and salicylic acids plus thymol (*d*); *D*, benzoic and salicylic acids plus monochlormercuricarvacrol (*e*); *E*, monochlormercuricarvacrol in dusting powder (*l*). The clear bars represent results obtained on culture mediums not containing serum, and the black bars, on mediums containing serum.

Fungicidal activity was demonstrated by investigating the behavior of solutions rather than ointments containing monochlormercuricarvacrol. A saturated solution of monochlormercuricarvacrol was found to be without effect. However, a saturated aqueous solution of it plus benzoic and salicylic acids (*j*) and a tincture (*k*) of these same three compounds were found to fall within the standards set by the Disinfectant Scientific Committee of the National Association of Insecticide and Disinfectant Manufacturers when the method of Klarmann, Shternov and Costigan [12] was employed. The data in table 2 indicate typical results. The tincture (*k*) may be diluted with water 1:1 or 1:3 and still be effective in killing a spore suspension of T. rosaceum in one minute. Preparations such as these are recommended for use as foot baths. Further evidence of fungicidal activity was apparent when growth failed to occur in Sabouraud broth in which pieces of agar taken from zones of inhibition were subcultured.

Monochlormercuricarvacrol alone (*a* and *b*) is more effective in fungistatic action than ointment of benzoic and salicylic acid N. F. (*c*). Figures 2 and 3 (center row) illustrate this, as do the bars in the group at the left side of figures 5 and 6. The percentage reduction due to serum is about 50 per cent for the fungi, 39 to 64 per cent for the yeasts and 57 per cent for the bacterium.

Liquid preparations were selected because of the application of some of them for specific types of dermatophytoses. Use of salicylic acid in ethyl alcohol (*i*) has been reported frequently. The eutectic mixture resulting from phenol and camphor (*h*) received considerable publicity after Francis'[21] original note; it was studied in vitro. Salicylic acid in alcohol (*i*) was slightly fungistatic, comparing favorably with the ointment containing only monochlormercuricarvacrol (*b*) (fig. 3, top row, right). The phenol-camphor mixture (*h*) was effective, for, in addition to inhibiting mycelial growth, it likewise suppressed sporulation. Limitations of its application, however, will be discussed later.

A dusting powder (*l*) containing monochlormercuricarvacrol was tested. Because of the slow rate of diffusion, only small zones of inhibition resulted, yet they varied from 5 to 8 mm. from the cup to the first visible sign of growth.

TABLE 2.—*Fungicidal Action of Solutions Containing Monochlormercuricarvacrol (T. Rosaceum, Test Organism; Temperature, 20 C.)*

Test Solutions	Survival in Minutes		
	1	5	10
Saturated aqueous solution of benzoic and salicylic acids + monochlormercuricarvacrol (j)	—	—	—
Tincture (isopropyl alcohol) of benzoic and salicylic acids + monochlormercuricarvacrol (k)	—	—	—
Standard			
Phenol 1:70	—	—	—
Phenol 1:80	+	—	—
Phenol 1:90	+	+	—

A measurement of 4 mm. is considered satisfactory. No powder containing monochlormercuricarvacrol plus benzoic and salicylic acids was tested. The effectiveness of the bentonite base powder is represented graphically in figures 5 and 6.

COMMENT

Seven micro-organisms used in these studies are representative of those likely to be encountered in fungous infections of the skin. Lewis and Hopper[8] found in 23 of 1,200 patients examined simultaneous or successive presence of two or more species of pathogenic fungi which were considered the causative agents of mycotic infections. Among such combinations they found T. gypseum associated with T. purpureum, while M. albicans was found associated with either of the two species of trichophyton. Any survey involving a fungistatic or fungicidal agent should therefore include observations on its effects against all of the organisms which have been reported associated with fungous infections. Different species of the same micro-organisms vary in their resistance toward chemical agents used in treatments designed to combat dermatophytoses. Investigations reported herein disclose T. rosaceum to be the most resistant of the moldlike fungi studied, while Lewis and Hopper[8] stated that in their studies T. purpureum resisted treatment.

21. Francis, E.: Phenol-Camphor for "Athlete's Foot," J. A. M. A. **117**:1973 (Dec. 6) 1941.

There may also be differences in strain variation within the same species which should not be overlooked.

The moldlike yeasts differed slightly between species, but as a genus their zones of inhibition were considerably smaller than those of either species of trichophyton or of epidermophyton.

Staph. aureus, ever present on the surface of the normal skin, is logically included in these studies.

From the data in table 1 and the photographs in figure 1 it is apparent that when a fungistatic or fungicidal agent is incorporated into an ointment consisting of a fat base, a decided reduction, probably due to decreased solubility, occurs in its inhibitory activity. This reduction may vary from 33 to 43 per cent for the molds and from 39 to 56 per cent for the yeasts. The same phenomenon was observed by Foley and Lee,[17] who recommended hydrophilic bases for the more successful operation of certain bactericidal agents. From a clinical point of view the fat base ointments are objectionable because many patients object to the "greasy feel" associated with petrolatum bases.

To simulate conditions as they might exist in vesicular dermatophytoses, studies have usually been made of effects in the presence of 10 per cent blood serum. From the data in figures 5 and 6 it becomes apparent that the presence of additional organic matter reduces the zone of inhibition, the reduction varying with the microorganisms and species studied as well as with the nature of the inhibiting agent. This was to be expected, since Miller and Rose [22] have reported that the effectiveness of mercury compounds varies with the dilution of the antiseptic and with the blood content of the substrate; mercurials were more affected by the serum than were phenols or dyes.

Salicylic and benzoic acids, the two components of Whitfield's ointment (ointment of benzoic and salicylic acid N. F.), have been known to be strongly fungistatic. Their activity is not due to their acidic characters but rather to the anion, according to Gould and Carter.[23] Iványovics,[24] on the other hand, attributed the activity of salicylic acid to competition with an essential metabolite, e. g., displacement of pantothenic acid from a protein molecule. By comparison with other test compounds used in this study the official ointment was not particularly effective.

Thymol has been reported by O'Brien and Bonisteel [25] and others to be an effective fungistatic agent. Mercuriated thymols were reported to be fungicidally active toward E. interdigitale and T. gypseum by Barry, Hartung and Grubb,[1] while Kojima [3] stressed the bactericidal powers of halogenated thymol and carvacrol.

Burt's [5] observations suggested that the mercuriated derivatives of carvacrol might be better fungistats than thymol; the data and photographs in figures 2 to 6 inclusive support this contention. When monochlormercuricarvacrol is substituted for thymol in a mixture of benzoic and salicylic acids, a zone of inhibition is obtained which is considerably greater than that with the ointment containing thymol. The official ointment of benzoic and salicylic acid when used full strength is not quite as efficient as 1 per cent monochlormercuricarvacrol (figs. 2, 3, 5 and 6).

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22. Miller, R. E., and Rose, S. B.: Studies with the Agar Cup-Plate Method: III. The Influence of Agar on Mercury Antiseptics, J. Bact. **38**:539-547, 1939.

23. Gould, A. G., and Carter, E. K.: Fungistasis in Ringworm of the Toes and of the Feet, Arch. Dermat. & Syph. **22**:225-231 (Aug.) 1930.

24. Iványovics, G.: Mechanism of the Antiseptic Action of Salicylic Acid, Naturwissenschaften **30**:104, 1942; Chem. Abstr. **37**:227, 1943.

25. O'Brien, F. J., and Bonisteel, W. J.: Fungistatic Value of Certain Ointments, J. Am. Pharm. A. (Scient. Ed.) **30**:191-196, 1941.

Ordinarily the ointment is used in half strength. Strauss [26] in a recent report stated that ointment of benzoic and salicylic acid N. F. was effective in treatment of the moderately severe infections which he encountered in the army.

Some question may arise as to the efficiency of testing mercury compounds in an agar substrate, as is done in the agar cup plate technic. Miller and Rose [22] found that agar exerts little or no effect on the antiseptic properties of mercury compounds. Emphasis must be placed, however, on the factors which influence the accuracy and reproducibility of the agar cup plate technic. These, outlined by Rose and Miller,[11] include thickness of the medium, concentration of agar, amount of test compound, size of inoculum, p_H of substrate and presence of added organic matter.

The danger of the phenol-camphor mixture advocated by Francis [21] has been stressed by Calvery [27] and Glenn and Hailey,[28] the latter having obtained clinical data gathered from observations on navy air cadets. Satisfactory application, on the other hand, to military personnel was indicated by Strauss.[26] Its use is limited because of its toxic nature, particularly on moist surfaces.

Laboratory tests indicate that the sulfonamide compound studied, sulfathiazole, is ineffective (fig. 2). Rademacher,[18] on the other hand, reported successful treatment of trichophyton infections with 25 per cent and 50 per cent sulfathiazole in

TABLE 3.—*Comparison of Effectiveness of Four Preparations Based on the Area of the Zone of Inhibition (Areas Expressed in Square Centimeters)*

	Monochlormercuricarvacrol (*b*)			Ointment of Benzoic and Salicylic Acid N. F. (*c*)			Benzoic and Salicylic Acids + Thymol (*d*)			Benzoic and Salicylic Acids + Monochlormercuricarvacrol (*e*)		
	Without Serum	With Serum	Total	Without Serum	With Serum	Total	Without Serum	With Serum	Total	Without Serum	With Serum	Total
Molds.....	58.10	28.24	86.34	33.89	17.75	41.64	93.09	54.74	147.83	111.74	71.88	183.62
Yeast.....	9.71	4.18	13.89	3.86	1.46	5.32	18.43	16.16	34.59	21.42	17.84	39.26
Bacterium.	8.63	3.77	12.40	2.26	1.29	3.55	7.54	6.50	14.04	11.02	11.02	22.04
Total....	76.44	36.19	112.63	40.01	20.50	60.51	119.06	77.40	196.46	144.18	100.74	244.92

talc. Keeney and associates [29] and Spink and Paine [30] cited successful responses to treatment of furunculosis (sulfathiazole) and staphylococcic infections (sulfathiazole) respectively, while Sulzberger [31] effectively treated moniliasis with sulfapyridine. Sulfathiazole was employed unsuccessfully in the treatment of dermatophytosis and inguinal granuloma (Robinson and Robinson [32]). It is possible that Rademacher's striking responses may be largely attributed to the suppression of the activities of secondary invaders usually associated with severe "athlete's foot." In vitro studies by Dimond and Thompson [19] indicated that a sufficient amount of paraaminobenzoic acid in bacteriologic peptone inhibits the activity of sulfathiazole. My data support their observations.

26. Strauss, S. D.: Trichophyton Foot Infections, Mil. Surgeon **91**:348-349, 1942.

27. Calvery, H. O.: Warning on the Use of Phenol-Camphor in Cases of "Athlete's Foot," J. A. M. A. **119**:366 (May 23) 1942.

28. Glenn, W. R., and Hailey, H. E.: Fungous Infections of the Feet Treated with a Camphor-Phenol Mixture, Arch. Dermat. & Syph. **47**:239-241 (Feb.) 1943.

29. Keeney, E. L.; Pembroke, R. H.; Chatard, F. E., and Ziegler, J. M.: Sulfathiazole Ointment in the Treatment of Cutaneous Infections, J. A. M. A. **117**:1415-1417 (Oct. 25) 1941.

30. Spink, W. W., and Paine, J. R.: The Local Use of Sulfathiazole in the Treatment of Staphylococcal Infections, Minnesota Med. **23**:615-619, 1940.

31. Sulzberger, M. B.: Moniliasis and Moniliids Treated with Sulfapyridine, Arch. Dermat. & Syph. **40**:854-855 (Nov.) 1939.

32. Robinson, H. M., and Robinson, H. M., Jr.: Local Use of Sulfathiazole in Dermatoses, South. M. J. **34**:1093-1095, 1941.

There are undoubtedly some limitations to the tests when conducted in vitro; however, they are sufficiently practical to indicate what may be anticipated of the effectiveness of the ointments in clinical practice. The test is severe and critical, since (*a*) observations are made on the penetrability of the preparations through a substrate simulating body tissue and (*b*) their activity is also observed in the presence of blood serum.

The dusting powder does not exhibit zones of inhibition of the order of the ointments. This is possibly due to the reduced rate of diffusion into the substrate because of the dry, solid character of the substance.

By way of summary, in table 3 may be found a comparison of the effectiveness of the four principal preparations under investigation. The synergistic action of the three ingredients in preparation "*e*" again becomes apparent.

SUMMARY

1. Fungistatic agents incorporated in hydrophilic bases exhibit greater zones of inhibition than do agents incorporated in petrolatum bases.

2. The presence of blood serum reduces the zone of inhibition.

3. Micro-organisms differ in resistance toward fungistatic agents.

4. Monochlormercuricarvacrol exhibits decided fungistatic activity when used in combination with benzoic and salicylic acids in a hydrophilic base and decided fungicidal action in a tincture.

5. Sulfathiazole under the experimental conditions did not exhibit fungistatic activity in vitro.

TREATMENT OF TINEA WITH ETHYL CHLORIDE

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In the South Pacific, treatment of lesions of the tinea group with ethyl chloride has given uniformly excellent results. There are no contraindications to its use, even though the lesions may be covered by pustular eruptions due to secondary infections. The length of treatment depends solely on the age of the infection and not on the area it covers. All of it must be treated at one sitting. No other drug or dye should be used in conjunction with ethyl chloride; fungicides in ointment bases definitely retard healing.

Ethyl chloride is easily applied and, except for surfaces which are closely covered (the foot), requires no bandages. The drug quiets the intense reaction with the second or third application, produces no sensitization dermatitis and aids natural responses toward healing. The inflammation and pain associated with tinea lesions of the fingers, which make it difficult to flex the fingers, both disappear after the second application, as does the itching. With chronic indurated lesions the spray is never felt until the inflammation has largely subsided, a favorable healing index.

The ethyl chloride is sprayed on only until the temperature of the skin has been lowered sufficiently to bring out the white surface. In a few instances, the spray may be held for two or three seconds longer; the occasions will be noted later.

Vesicles, whether they contain active fungi or are dermatophytids, should never be opened. No matter what size they have attained when first seen, this caution should be observed. If the lesion is a vesicle, the spray is applied to the whole area; if it is a macule or larger, the spray is applied around the edge and two to four applications are made, depending on the size. The fluid will be absorbed, the lesion becoming dry. Distant allergic manifestations require only one application to allay itching.

Primary lesions or small grouped lesions with no erythema are sprayed a few seconds longer than necessary to bring about the white reaction. Two to four applications are necessary. The area dries and exfoliates, and the cure is permanent.

Tinea circinata which has spread peripherally with actively inflamed raised margins hiding the vesicles requires slightly different use of the spray. The whole raised margin is sprayed once daily for two successive days. With the disappearance of the inflammation, discrete vesicles become prominent and are treated as though they were primary lesions.

In tinea of the hands and feet the lesions are more destructive and take longer to heal, but only about half the time necessary with dyes or lotions. Tinea which has prevailed for five or six months under treatment will require three to five weeks' treatment with ethyl chloride. After the first week of daily applications, spraying on alternate days is sufficient. The first few sprayings are applied only around the margin of the lesion; as healing proceeds, islands of denuded epithelium varying in size appear. Thereafter spraying is confined to these islands; the whole surface is covered.

Tinea-like pompholyx which appears on the hands requires one or two sprayings.

Any tinea lesion, regardless of where it appears and whether it is acute or chronic, may be treated with ethyl chloride. The method is superior to that with any fungicide now used.

A SCHEMATIC CLASSIFICATION OF ANIMAL ORGANISMS CAUSING DERMATOLOGIC DISEASES

MAXIMILIAN E. OBERMAYER, M.D.
LOS ANGELES

In preparing an exhibit[1] on diseases due to animal organisms (excluding protozoa), the accompanying chart was constructed. To my knowledge, no similar tabular classification is available in dermatologic textbooks, and I believe that such a chart may have both general and pedagogic interest.

In construction of the chart emphasis was placed on keeping the material and its arrangement as simple as possible. Consequently, no attempt was made to include data on the parasitologic classification[2] of the organisms referred to, such as classes, orders and families, because the inclusion of such information would have made the chart unwieldy and unreadably complex. However, readers who are interested in the classification of the organisms will find the pertinent parasitologic data in Hegner, Root, Augustine and Huff's "Parasitology."[3]

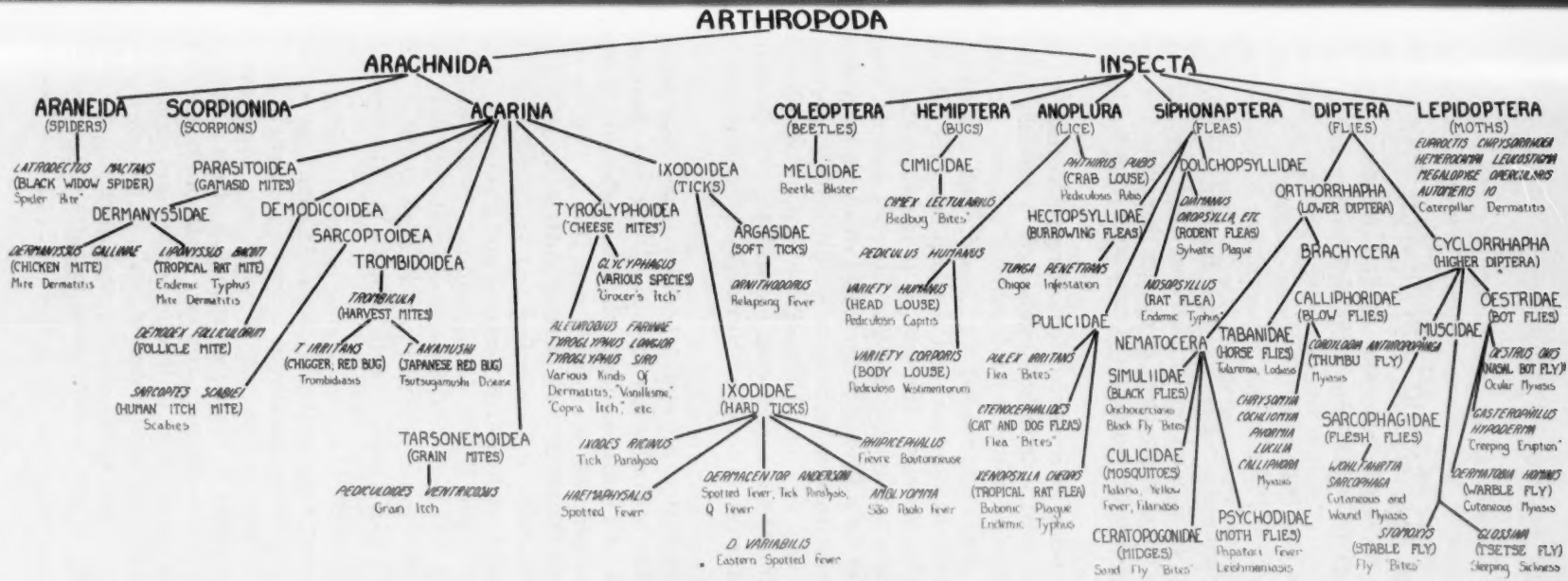
The chart makes no claim to completeness, but it does list all animal organisms of practical dermatologic importance in the United States and the diseases which they cause.

From the Department of Dermatology and Syphilology, School of Medicine, University of Southern California.

1. The exhibit was shown at the third and fourth annual meetings of the American Academy of Dermatology and Syphilology, Chicago, Dec. 8, 1940, and New York, Dec. 14, 1941, and at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 1941.

2. Dr. Clay G. Huff, Professor of Parasitology in the University of Chicago, cooperated in the composition of the chart.

3. Hegner, R. W.; Root, F. M.; Augustine, D. L., and Huff, C. G.: Parasitology, with Special Reference to Man and Domesticated Animals, New York, D. Appleton-Century Company, Inc., 1938. The classification in the chart follows closely that of this text.



Diseases due to animal organisms (excluding protozoa).

RESULTS OF A QUESTIONNAIRE ON PATCH TESTS

ANALYSIS OF ANSWERS BY TWO HUNDRED AND ELEVEN DERMATOLOGISTS AND FIFTY-FIVE INDUSTRIAL PHYSICIANS

JOHN G. DOWNING, M.D.
BOSTON

Patch tests appeal to the medical and to the lay mind and therefore are becoming more and more popular. There is no question but that they have been valuable in determining the causative factor in many cases of contact dermatitis and have helped to solve many of the problems of that group of cutaneous eruptions loosely labeled as "eczema."

They have been of distinct value in industrial dermatology. In this field of medicine with the diagnosis of contact dermatitis established, a carefully taken history denoting exposure to certain chemicals, followed by properly executed patch tests and a characteristic eruption at the test site, should result in a cure of the patient by removing him from the exposure, and should prevent the affliction of others by its removal from the process. However, if it is proved that it is merely a reaction of a hypersensitive individual, and that the work does not affect others, then the simple removal of the individual rather than a change in the process is the sensible procedure. The early recognition of hazards today is most important, for the loss of one key worker may slow up or temporarily stop the activities of a group of fellow workers. With the introduction of innumerable new chemicals in the form of substitutes or alternates, a careful check-up of the employees is essential.

With the aforementioned facts in view and especially the agitation about testing employees before they are hired or before the introduction of these new chemicals, it was thought worth while to send a questionnaire to physicians interested in this branch of medicine. A questionnaire was accordingly sent Dec. 1, 1941 by the office of the Council on Industrial Health of the American Medical Association to 600 members of the American Academy of Dermatology and Syphilology and 200 fellows of the American Association of Industrial Surgeons and Physicians. Two hundred and sixty-six replied, of whom 211 are dermatologists. Twelve questions were asked, but questions X and XII were probably framed poorly and were misunderstood; the replies to them were so confused that they were not tabulated. The following paragraphs represents a brief summary of the replies. Wherever possible figures have been reduced to percentages.

I. Are Patch Tests of Increasing Value in the Diagnosis of Contact Dermatitis? —When patch tests are used in cutaneous diseases in which they are not indicated they often lead to fallacious decisions. They are of value only in dermatitis venenata and dermatitis medicamentosa in which the eruption is of the eczematoid type. The questionnaires showed the following replies: Undoubtedly the large majority of the persons replying are in favor of them. Seventy and eight-tenths per cent answered "yes," while 11.3 per cent answered "no"; of the latter group 97 per cent are dermatologists. They agreed for the most part that a careful examination and thorough taking of the history solved the problem without the use of patch tests.

II. Describe Your Method of Application and Sites Commonly Used.—There was fairly uniform agreement regarding the methods of application. The physicians for the most part followed the outline described in standard textbooks on dermatology, and less than 2 per cent suggested modifications. Some of the modifications had a certain amount of value, but the majority of them were not constructive and involved too much detail and unnecessary procedure. Only 1.8 per cent suggested any initial preparation of the skin at the test site, such as cleansing with ether, alcohol or soap and water. The choice of areas for the performance of the tests was rather interesting. Inasmuch as many physicians favored more than one site, it was impossible to reduce these figures to percentages. The arms, however, predominated. Sixty-three mentioned the arm without distinguishing the arm or the forearm, while 34 specified the former and 88 the latter. Most dermatologists specified the inner, or flexor, aspect of the arm. No one stated that he left the tests on for more than forty-eight hours.

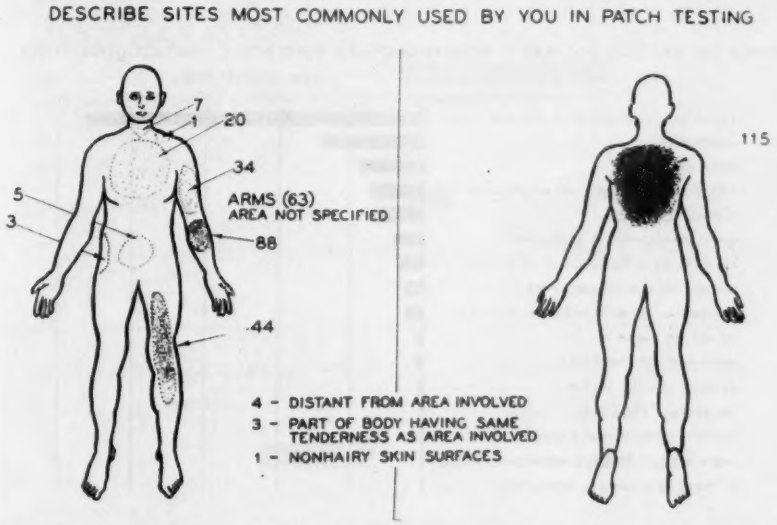


Chart 1.—The site most commonly chosen, especially by dermatologists, was the flexor surface of the arms.

III. When Do You Usually Test a Patient Who Has Suffered a Contact Dermatitis?—I believe this question is of the utmost importance. Physicians experienced in performing these tests have learned that it is unwise to test during the acute stage of the eruption and also that as few patches as possible should be applied at one time. It was strange to note that a fairly large percentage tested immediately; however, there were few dermatologists in this group.

IV. Are Patients (Workmen) Requesting the Use of Patch Tests? Are Insurers Requesting Their Use?—Allergy, with its apparent cloak of mysticism, has intrigued the lay public and is now a byword on the radio and in various popular magazines; therefore, it is natural that any means of solving its problem will sooner or later become known to the public and that frequent requests for the performance of patch tests will be made by persons suffering from cutaneous eruptions. This is shown by the following chart, in which 25 per cent of the replies stated that patients requested their use. Naturally those who have to pay for the disability in industrial dermatitis will be likely to follow the popular trend, as is shown by the fact that more than half of the physicians interrogated answered affirmatively.

V. Are Insurers Insisting on Patch Tests in Cases in Which You Regard Them as Unnecessary?—Physicians doing considerable industrial work have been placed in the embarrassing situation of having insurers insist that patch tests be made when they themselves have regarded them as unnecessary, misleading and perhaps dangerous. This has resulted in part because of their injudicious use by inexperienced physicians who have used primary irritants in patch tests. The use of such materials or chemicals will produce a reaction in persons who are not suffering from contact dermatitis. Seven and two-tenths per cent of the answers were affirmative, indicating that some insurers insist on their being made routinely.

VI. Should Patch Tests Be Made by General Practitioners? By Industrial Physicians Routinely?—Experience has taught that while patch testing is apparently a simple procedure, these tests are of no value unless wisely employed, correctly performed and intelligently interpreted. Seventy-two per cent of the men who answered that these should not be made by general practitioners were dermatologists, who definitely stated that the tests should be made only by physicians

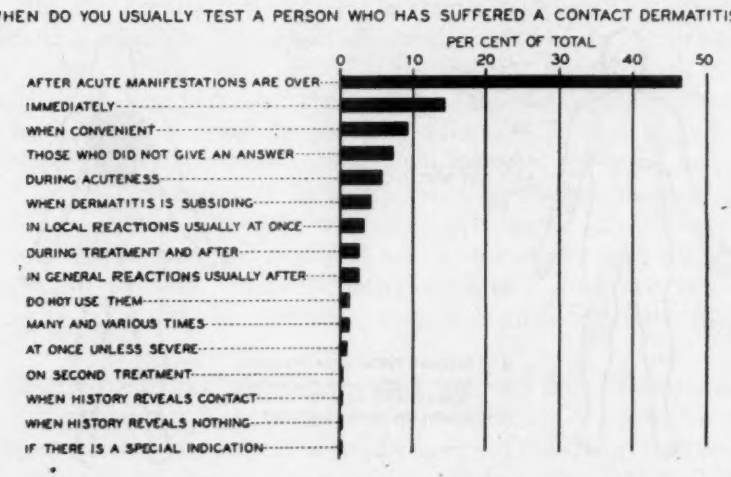


Chart 2.—The answers show that most physicians agree that patch tests should be done after the acute dermatitis has subsided.

trained in dermatologic procedure. The experience of dermatologists in large clinics has shown that routine patch testing is of little value and may be dangerous. This was evidenced by the fact that 80 per cent of those who answered "no" were dermatologists.

VII. Do You Believe in Preemployment Patch Testing? Explain Why.—As was previously mentioned, with the tremendous increase of industrial activities and the rapid introduction of new chemicals as substitutes or alternates, it has been suggested that the new employees be tested with these substances before they are accepted for work or before these chemicals are introduced into the various processes. It has been thought by many persons that most of the occupational dermatitides could be prevented by such preemployment patch tests. The replies to this question were interesting and varied. Eighty-five per cent of the persons answering "no" are dermatologists. In addition to the remarks listed herein many others were made. For example, the worker's period of refractoriness may be extended over a period of years; many men have worked in a plant as long as twenty years before they have been affected. Others stated that patch tests are

not equivalent to ordinary industrial exposures. False positive reactions may cause unnecessary loss of time, and the attempt to eliminate suspected exposures may be not only expensive but unnecessary owing to the fact that such exposures never existed. Again, false positive reactions may cause a sense of uneasiness among the employees. False negative reactions, on the other hand, may cause a false sense of security, with the result that the employees become careless, believing that they are immune. Instead of saving time they are an unnecessary waste of

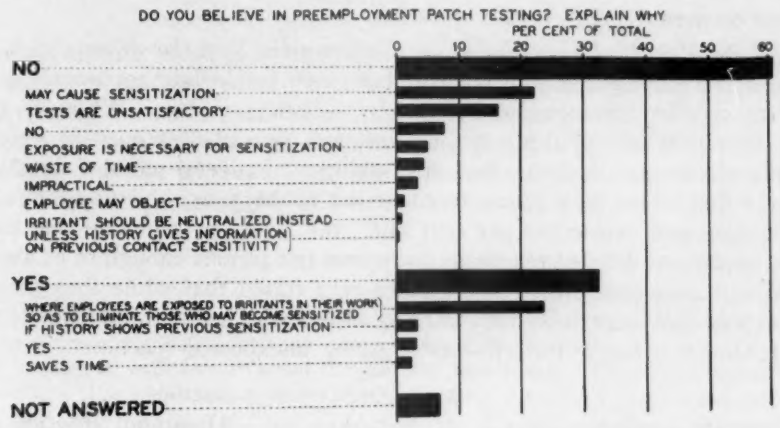


Chart 3.—The results show that preemployment patch tests are not advised.

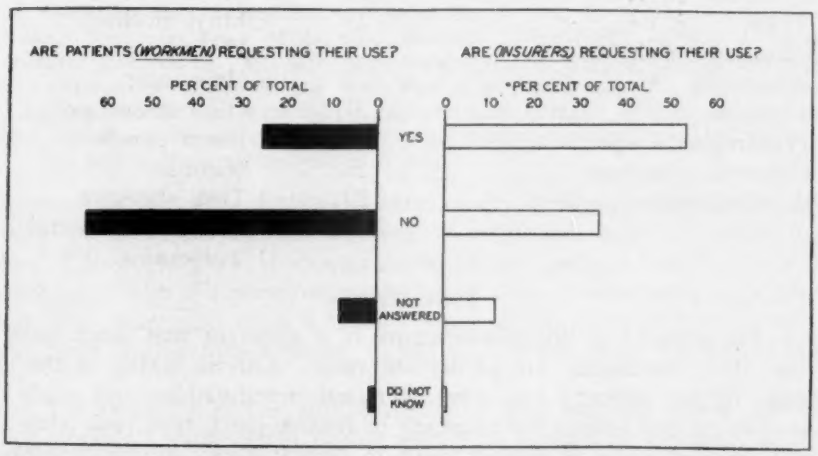

ARE PATIENTS (WORKMEN) REQUESTING THEIR USE?
PER CENT OF TOTAL
60 50 40 30 20 10 0
ARE (INSURERS) REQUESTING THEIR USE?
*PER CENT OF TOTAL
0 10 20 30 40 50 60
YES
NO
NOT ANSWERED
DO NOT KNOW

Chart 4.—The answers show that patch tests are becoming more popular with the laity.

time, a factor which must be thought of in these days of increased speed and activities for the increased production that is so necessary for the armed forces.

VIII. Does the Agency Administering Workmen's Compensation in Your State Recognize Patch Tests? Insist on Them?—This question brought forth many complaints from dermatologists and industrial physicians from all over the country that their state does not recognize industrial dermatoses. It was felt by all that this is an injustice to the worker and should be remedied.

IX. Have You Had Any Legal Difficulties Due to Their Use?—Lawsuits and claims due to harmful effects resulting from the use of patch tests have already been experienced by some dermatologists, and I have discussed this problem in a recent paper.[1] Patch tests have established their value in determining the causative factor of dermatitis venenata and dermatitis medicamentosa with eczematous reactions. If the physician possesses the necessary knowledge and training and the tests are used when indicated and properly performed with the usual precautions, I do not believe that he need worry about the legal aspects. Fourteen physicians answered "yes" to this question.

XI. Have You Had Any Severe or Unfortunate Sequelae from Patch Tests?—It cannot be emphasized too much that a patch test, while apparently a simple procedure, may be accompanied by various serious sequelae. While up to date there is no report of any death having resulted, nevertheless even in my limited experience patch tests have resulted in disabilities of several months' duration. It is apparent that others have encountered similar mishaps, as shown by the following list. Eighteen and two-tenths per cent said "yes"; 7.2 per cent said that they had observed occasional decided reactions, not severe but serious enough to be annoying; 53.2 per cent answered "no"; and 1.9 per cent stated that while they themselves had never had such experience they knew of others who had had unfortunate results. The following is a list of the substances giving unexpected reactions:

Adhesive .....(3)	Acetone
Chromate solution .....(3)	Aluminum chloride
Cashew nut shell oil.....(2)	Arsenic
Caustic .....(2)	Black silk
Cinnamon oil .....(2)	Citrus oil
Nickel .....(2)	Ethyl alcohol
Paraphenylenediamine .....(2)	Floor wax
Poison ivy .....(2)	Hair tonic
Primrose .....(2)	High octane gas
Trinitrophenol (picric acid).....(2)	Insect powder
Unknown chemicals .....(2)	Nicotine
Weed extracts .....(2)	Teak shavings
	Tincture of merthiolate
	Turpentine

CONCLUSIONS

From the answers to this questionnaire it is apparent that patch tests, while they have their limitations, are of definite value. Careful taking of the history, knowledge of the patient's exposures, personal investigations and study of the various contacts will reduce the necessity of routine patch tests, but when needed they will continue to be of distinct value in dermatology. Wisely employed and interpreted, they will not suffer the fate of the scratch tests, which have proved disappointing as an aid in dermatologic research. Preemployment patch tests are not practical.

520 Commonwealth Avenue.

1. Downing, J. G.: Legal Aspects of Patch Tests, Arch. Dermat. & Syph. **44**:63-65 (July) 1941.

VITILIGO IN THREE SIBLINGS

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CLINTON, IOWA

The occurrence of vitiligo in 3 members of one family is of sufficient rarity and interest to warrant reporting. Heredity as a factor in the following cases can apparently be ruled out, as careful examination of the father and mother failed to reveal any presence of the disease in them. There is also no history of vitiligo affecting the grandparents, paternal and maternal, or relatives of more distant kinship, such as uncles and aunts.

REPORT OF CASES

CASE 1.—E. H., a white girl aged 18, first presented signs of vitiligo at the age of 8 years, with the appearance of typical milk-white lesions on both cheeks, the forehead and the chin. From these areas the disease steadily progressed to the V of the neck and then involved anterior surfaces of both forearms and the dorsa of both hands. The patient stated the belief that there is a slow but steady progress of the disease.

CASE 2.—A. H., the 16 year old sister of E. H., had two white spots the size of a 10 cent piece on the left cheek; they appeared about a year ago. These were followed in three months by two other lesions of vitiligo on the left forearm, and at the time of this examination several spots were discernible on the anterior surfaces of both thighs.

CASE 3.—G. H., the 13 year old brother of E. H. and A. H., became aware of his vitiligo about two years ago. Of the three members of the family affected he showed the most extensive involvement. His face, both arms, forearms and the back of the hands had numerous white spots ranging in size from that of a pea to that of a silver dollar. The borders on exposed surfaces were deeply pigmented as a result of tanning from sunlight. Premature canities of the eyebrows and of the occipital and parietal areas of the scalp was present. The hair in these regions was iron gray.

The medical histories of these children were inconsequential, since they had had only the common diseases incident to childhood, none of which had left sequelae. Thorough physical examinations of the patients failed to reveal any abnormalities. The Wassermann reactions of their bloods were negative. The children were descended from a healthy stock of Midwestern farmers and were mentally alert and in robust health. They applied for relief for purely cosmetic reasons.

With the exception of the vitiligo the skins were normal. There was no evidence of alopecia areata, lichen planus, psoriasis, syphilis or thyroid disturbances. Neither scratching nor trauma played a role. Functional and organic nervous diseases were absent. Pseudoachromia parasitica was eliminated.

419 South Second Street.

CONGENITAL AURICULAR FISTULA

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DULUTH, MINN.

Congenital auricular fistula has been described under various names, such as fistula auriculae congenita, fistula preauricularis congenita, fistula auris congenita and sinus preauricularis.

The fistula in most cases is manifested by a small pinhead–sized dimple which usually occurs on the inferior portion of the ascending limb of the helix but may be found anywhere about the external ear. The external opening is frequently filled with a keratotic plug which is adherent and may resemble a blackhead. The depth of the sinus is usually 1 to 3 mm., but Schüller [1] reported a case in which it was 22 mm. It is seldom that symptoms develop, but the sinuses may give rise to an offensive discharge, may become closed off with the development of a retention cyst or may become infected and cause pain and swelling.

Congenital auricular fistula was first described by Heusinger [2] in 1864, and since that time numerous reports have appeared. Selkirk [3] was able to find 172 instances of the abnormality while making a routine examination of school children. He found an incidence of 0.9 per cent among the white children and 5 per cent among the Negro children. The defect was bilateral in nearly 23 per cent of those affected, and in no instance did any major congenital defect, such as congenital heart disease or clubfoot, exist. Several children had associated abnormalities of the ear, such as accessory cartilages, microtia and atresia of the external auditory canal. Selkirk found that the majority of sinuses opened on the ascending limb of the helix; the location next in frequency was the crus helix and that least often involved was the lobule of the ear. Unlike other investigators, he did not observe remnants of branchial clefts. Druss and Allen,[4] however, described a case in which the sinus communicated with the neck and there were both squamous and columnar epithelium present in the sinus tract. Sinus preauricularis is the simplest and commonest type of developmental abnormality of the external ear. The stages in the embryologic development of the ear are still obscure. Arey [5] expressed the opinion that the auricle develops from tissue around the first mandibular arch and the second hyoid arch. Six tubercles form on the arches and fuse to develop the external ear. Improper union of any of these elements may give rise to an auricular fistula. The external auditory meatus is formed by the union of the first branchial groove and the first pharyngeal pouch. In some instances the auricular fistula may include portions of the pharyngeal pouch and therefore may contain columnar epithelium. Becker and Brunschwig [6] found such a fistula in 1 of their patients.

From the Duluth Clinic, Duluth, Minn.

1. Schüller, J.: Zur Vererbung der Fistula auris bsw. auriculae congenita; zugleich ein klinischer Beitrag, München. med. Wchnschr. **76**:160, 1929.
2. Heusinger, K. F.: Hals-Keimen-Fisteln von noch nicht beobachteter Form, Virchows Arch. f. path. Anat. **29**:358, 1864.
3. Selkirk, T. K.: Fistula Auris Congenita, Am. J. Dis. Child. **49**:431 (Feb.) 1935.
4. Druss, J. G., and Allen, B.: Congenital Fistula of the Neck Communicating with the Middle Ear, Arch. Otolaryng. **31**:437 (March) 1940.
5. Arey, L. B.: Developmental Anatomy, ed. 4, Philadelphia, W. B. Saunders Company, 1940.
6. Becker, S. W., and Brunschwig, A.: Sinus Preauricularis, Am. J. Surg. **24**:174, 1934

From reports in the literature it seems evident that there is a hereditary predisposition to the development of congenital auricular fistula. Selkirk [3] found the defect to be present in several parents whose children were affected. Schüller [1] found 26 persons with this condition in four generations of a family of 70 people. Montgomery [7] described 3 cases in one family. Fox [8] recently reported its occurrence in a mother and her 5 children, for 3 of whom surgical treatment was necessary.

Fig. 1 (case 1).—Congenital auricular fistula with secondary infection of two years' duration. The photograph shows the ulcerated area, and the arrow points to the opening of the fistula.

Fig. 2 (case 2).—Congenital auricular fistula of the lobule of the ear of forty years' duration; the external opening is shown.

REPORT OF CASES

CASE 1.—S. B., a white boy aged 6 years, scratched his left temple on a nail in the spring of 1940. Treatment at that time consisted of applications of various local antiseptics, but the wound failed to heal. After it had continued to discharge for several months a physician was consulted. In the ensuing two years the patient received various types of therapy, including many antiseptic ointments, repeated cauterizations and several surgical excisions of the involved area. In each instance the area would crust over and then break down and discharge a purulent secretion. At the time of examination (fig. 1) a superficially ulcerated crusted area

7. Montgomery, M. L.: Congenital Auricular Fistula: Report of Three Cases in the Same Family, S. Clin. North America **11**:141, 1931.

8. Fox, M. S.: Congenital Aural Fistula, Arch. Otolaryng. **35**:431 (March) 1942.

1.5 cm. in diameter was found on the cheek just anterior to the ear. Underneath the crust was a purulent discharge which on culture revealed Staphylococcus aureus. Careful examination revealed a small keratotic plug just anterior to and below the ascending limb of the helix. Removal of the plug revealed a small dimple which led into a sinus that could be probed for about 1 cm. in the direction of the infected region. Methylthionine chloride U. S. P. (methylene blue) was then injected into this opening, and the colored material came out in the involved tissue. With the patient under ether anesthesia the sinus tract was dissected out. It was found to be extremely tortuous and led into the infected area, which was composed of granulation tissue. The entire sinus tract, including the granulation tissue, was curetted and packed with iodoform gauze. The gauze was removed after forty-eight hours and the area was allowed to fill in. A good cosmetic result was observed when the patient was seen three months later.

CASE 2.—Mrs. W. B., a white woman aged 46, was referred by Dr. K. R. Fawcett and gave the following history: Since childhood she had had recurrent swellings of the lobule of her left ear. On many occasions this area became reddened and swollen, so that surgical drainage was necessary. This would give relief, and after draining some purulent material for several days the opening would close over and give no further difficulty for a variable period of time, after which symptoms would again recur. On examination (fig. 2) the lobule of the left ear was swollen and slightly reddened. In the center of the lobule was a small dimpled opening, and 1 cm. posterior to it was another. A 25 gage hypodermic needle was inserted into this external orifice and methylthionine chloride injected. Two cubic centimeters was needed before the material came out of the second opening, and it was noted that the posterior portion of the external auditory canal had been distended by the injected material. The area was infiltrated with 2 per cent solution of procaine hydrochloride and the two openings joined by incision. The area was then probed, and a sinus tract was found to extend along the posterior surface of the auditory canal and to terminate in a blind ending just anterior to the tympanic membrane. This tract was opened with scissors, the edges trimmed and the wound packed with a wick of gauze. This was removed and fresh gauze inserted every three days. Unfortunately the patient left town before the area had entirely filled in. The packing was removed and not replaced. When the patient was examined two months later, there remained a small open epithelized canal 0.125 cm. deep. The fistula was cured, but a better cosmetic result could probably have been obtained had the wound been kept open until it filled in completely.

COMMENT

Two cases of a rather common anomaly of the external ear are reported in which complications developed. Auricular fistula has been shown by many investigators to be a hereditary congenital defect. Most cases go unnoticed because of lack of symptoms; however, if an infection develops persistent sinus tracts may form. These may be inadequately treated if the origin of the disease is unrecognized. If auricular fistulas are kept in mind when one is examining patients with persistent discharging or infected areas about the external ear, and if a careful search is made, the minute dimpled opening to the sinus tract can usually be found.

The second case reported is an example of an auricular sinus which occurred at an unusual location. The fact that its external opening was in the lobule of the ear and ran underneath the external auditory canal to terminate at the ear drum would suggest that this sinus had an embryonic origin similar to that of the external auditory canal, namely a branchial cleft. The first fistula could be either the result of a persistent branchial cleft or, more likely, the result of incomplete fusion of the embryonic tubercles which unite to form the auricle. The superficial nature of the sinus tract is indicative of the latter origin.

SUMMARY

Congenital auricular fistula is a common hereditary congenital defect which is usually asymptomatic and therefore overlooked.

Two cases are reported in which infection developed and produced persistent draining sinuses whose origin was not at first determined.

Proper surgical extirpation produced a prompt cure.

FIXED ERUPTION, CONJUNCTIVITIS AND FEVER FROM SULFATHIAZOLE

LIEUTENANT COMMANDER WILLIAM DIRECTOR, MC-V(S), U.S.N.R.

Cutaneous reactions from sulfonamide compounds are not infrequent, but conjunctivitis as a reaction is less common. In a recent paper, Dowling and Lepper [1] reported among their total of 149 patients with various reactions from sulfonamide compounds 7 with dermatitis alone, 3 with conjunctivitis alone, 5 with fever alone, 1 with dermatitis and conjunctivitis, 6 with dermatitis and fever, 3 with conjunctivitis and fever and 2 with all three complications.

I am reporting a case of fixed dermatitis, conjunctivitis and fever. The term "fixed" is used in the sense that the dermatitis is confined on recurring attacks to the same sites. Dowling and Lepper did not mention whether or not in any of their cases the site was fixed.

REPORT OF A CASE

J. J. S., a 34 year old white sailor, entered the hospital on March 6, 1943 with a tender mass in the left groin of three weeks' duration and a penile sore of eight days' duration. He had had sexual intercourse on several occasions, the last two days prior to the onset of the inguinal swelling. There was no history of previous penile sores. The patient had had boils on the right leg five years ago, accompanied with swelling in the right groin.

The penile lesion was a superficial linear erosion in the anterior sulcus with a clean serous exudate. The mass above the left inguinal ligament was roughly elliptic, 1½ inches by ½ inch (3.8 by 1.3 cm.), firm, slightly tender, with red overlying skin. Individual nodes could not be palpated at the onset.

Three dark field examinations of material from the penile lesion did not reveal Spirochaeta pallida, and Kahn tests gave negative results on March 4 and 15. Ducrey tests gave negative results. The Frei reaction was negative on March 9 and positive on March 29, 1943, and the diagnosis of lymphogranuloma venereum was established.

The patient was kept in bed and given 3 Gm. of sulfathiazole daily from March 16 through March 20, when the mass in the left groin subsided so that individual lymph nodes were palpable and continued to shrink in size.

On March 17, after one day of sulfathiazole therapy, several dusky red, edematous macules appeared on both sides of the neck. On the next day the edema of the macules increased, some of the lesions appearing depressed in the center. On March 20, new macules broke out; others continued to appear until by March 24 they formed confluent broad patches around the neck laterally and posteriorly. Small discrete red papules also appeared on the forehead, and both conjunctivas became diffusely injected. The use of sulfathiazole was discontinued on March 24, and the lesions began to fade by the next day; by March 26 they were almost completely gone, leaving a faint brown stain.

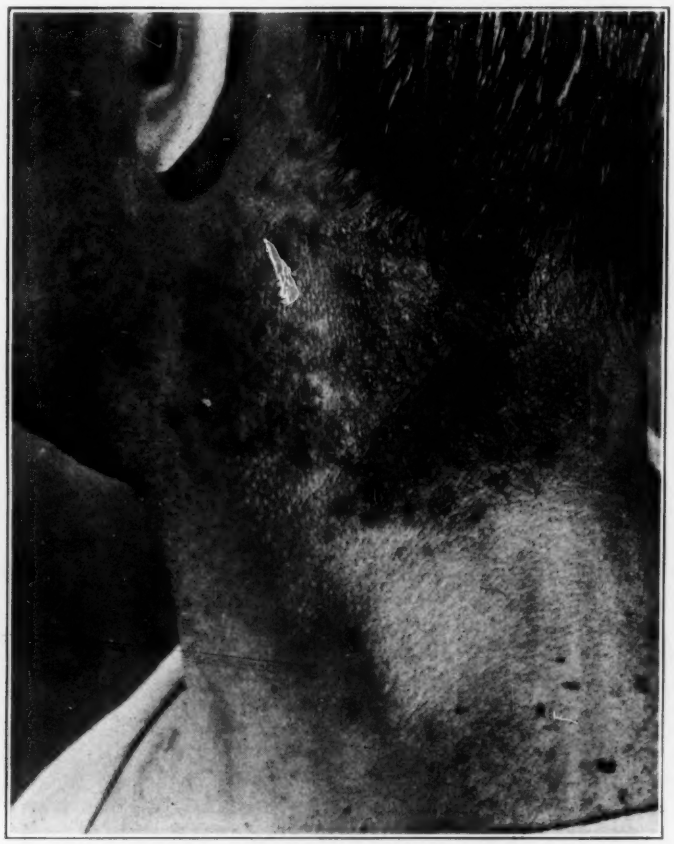
On April 5, after the patient had been out of bed for three days, there was a recurrence of the swelling in the left inguinal lymph nodes. The patient was again put to bed and given sulfathiazole, a total of 3.5 Gm. from April 5 through April 7. At noon on April 7 there was a recurrence of the eruption on the neck and face on the same sites as were previously affected. The lesions were rapidly fusing bright red edematous macules with irregular tops, resembling goose skin. There was also diffuse conjunctival injection, and a low grade fever was recorded; it was accompanied by moderate malaise.

Photographs were taken at 5 p. m. on March 7. The use of sulfathiazole was discontinued at noon on March 7, and twenty-four hours later the eruption had subsided so that only slight erythema remained; the conjunctival injection had completely faded.

On April 19, prior to his discharge from the hospital for the lymphogranuloma venereum, the patient was given 0.5 Gm. of sulfathiazole and the following observations were made:

1. Dowling, F. H., and Lepper, M. N.: Toxic Reactions Following Therapy with Sulfapyridine, Sulfathiazole and Sulfadiaziine, J. A. M. A. **121**:1190-1194 (April 10) 1943.

Elevation of temperature, accompanied by malaise, appeared first after an interval of four hours and fifteen minutes and rose slowly to a height of 102.6 F. in two hours, remaining on this plateau for three hours and then slowly subsiding to normal in six hours, a total febrile period of eleven hours. The conjunctival injection and dermatitis of the fixed sites on the neck and forehead appeared together after a latent period of five hours and forty-five minutes. The injected conjunctival vessels appeared first at the inner canthi and spread laterally. The injection disappeared completely in twenty-four hours. The same cutaneous sites previously affected flared into bright erythematous macules but did not become edematous. The dermatitis subsided completely in thirty-six hours. A differential blood count



Dermatitis following sulfathiazole therapy.

made after the point of greatest febrile activity showed the following values: polymorphonuclear leukocytes, 72 per cent (segmented forms 67 per cent and band forms 5 per cent); lymphocytes, 22 per cent; monocytes, 4 per cent, and eosinophils, 2 per cent. The urine was normal except for an occasional red blood cell.

It appeared obvious from the clinical description that the shock organ of the skin and conjunctivas was vascular, the reaction consisting of dilatation of the small vessels of the conjunctivae and vasodilatation and increased permeability of the small vessels of the corium in the areas affected by the dermatitis.

Since the patient's bed was near a screened window which was flooded with sunlight and he wore pajamas, fixation of the reaction on the face and neck may possibly have been in part produced by photosensitization. I did not, however, feel that there was any adequate proof for this assumption.

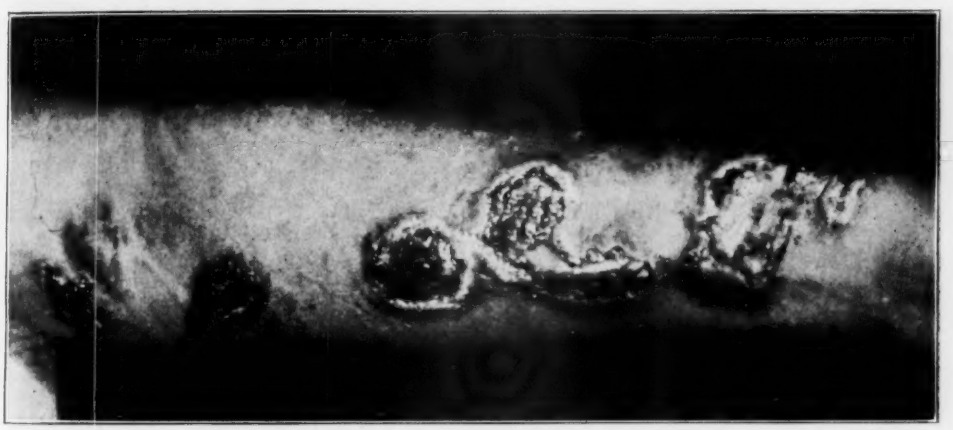
Concerning the latent period of sensitization, the patient did not recall ever having taken sulfathiazole before. If so, the latent period of sensitization could not have been more than twenty-four hours, since the original cutaneous lesions appeared one day after the first dose of the drug.

CII. SPOROTRICHOSIS FOLLOWING A MOSQUITO BITE

DESCRIPTION OF LESIONS IN A GIRL OF INDIAN AND FRENCH DESCENT

MORRIS MOORE, PH.D.
AND
GEORGE MANTING, M.D.
ST. LOUIS

Sporotrichosis has not been reported in the full-blooded American Indian. In their wide experience with dermatoses occurring in the Indian, Drs. Howard Fox and Everett S. Lain could not recall having seen the disease in a member of this race. In a personal communication, Dr. Lain indicated that when Indian and white blood is mixed the apparent immunity to certain cutaneous diseases common to the white race is lost. It is of interest, therefore, that the patient described here was



Lymphangitic sporotrichosis of the subcutaneous, ulcerating, gummatous type in a 9 year old girl of Indian and French descent.

of Indian and French descent (probably five-eights Indian and three-eights French).

A second point of interest in this case is the vector involved. A number of reports in the literature have shown that many agents may transmit the infection to man. Among these may be listed the horse, mule, dog, rat, parrot and hen. Since the organism may grow saprophytically in the soil, it has been found that vegetables, fruits, ornamental flowers and plants, including the barberry shrub, moss and other vegetation handled by farmers and florists have carried the fungus spores. Of especial interest is the fact that certain insects, like the wasp, ant and fly, may serve as vectors. It is not unlikely, therefore, that the lesions in our patient were induced by a mosquito bite, with the lodging of the fungus in the skin.

Studies, observations and reports from the Department of Dermatology of The Barnard Free Skin and Cancer Hospital, service of Dr. M. F. Engman Sr.

In view of the history of a primary mosquito bite followed by the lesion of sporotrichosis and the fact that the patient was of mixed Indian and French blood, the following case is reported.

REPORT OF A CASE

History.—M. F. M., a girl aged 9 years, of Indian and French descent, who was born in Missouri and had never been out of the state, presented herself in January 1943 at the dermatologic clinic of The Barnard Free Skin and Cancer Hospital, complaining of an eruption on the left forearm. She was living on a farm. The mother was a full-blooded Cherokee Indian, from North Carolina, and the father was one-fourth Chippewa Indian and three-fourths French, from Montana. The patient had had the usual diseases of childhood, including measles, mumps, whooping cough, chickenpox and pneumonia twice. Four years previously she had been in an automobile accident and had suffered a fractured skull, which resulted in a partial paralysis that lasted approximately three months. There was no history of ingestion of drugs. Three other children at home were free of lesions.

Her lesions were said to have begun five months previously, when she was bitten on the wrist by a mosquito. The affected area became a papule and then a nodule. The nodule became soft and fluctuant and then broke down to form an ulcer. Other nodules appeared extending up the forearm along the anterior aspect, and these nodules also became fluctuant and ruptured, forming ulcers. The ulcers did not heal, even though several physicians had applied various ointments.

Examination.—On her admission to the hospital it was noted that the patient was a well developed, well nourished child with a somewhat swarthy complexion and high cheek bones. The general physical examination revealed nothing unusual. On the left arm extending from the wrist along the anterior aspect of the forearm to just above the cubital fossa were seen irregular gyrate ulcers. These ulcers were indurated and raised, with a central area of bright red verrucous granulation tissue. The borders were undermined, raised in the form of a collar and violaceous, with the color extending to the adjacent tissue. The lesions appeared to be of subcutaneous origin and gummatous (fig.).

Laboratory Examination.—The urinalysis revealed normal conditions. The blood contained 4,470,000 red cells and 11,650 white cells per cubic millimeter and had a hemoglobin content of 81 per cent. The differential count showed 54 per cent polymorphonuclear neutrophils, 5 per cent eosinophils, 1 per cent basophils, 34 per cent lymphocytes, 3 per cent mononuclear lymphocytes and 3 per cent stab cells.

An unruptured nodule was aspirated and the material planted on Sabouraud's maltose and dextrose agar mediums. Three days later there appeared discrete pinpoint-sized colonies on the surface of the mediums. The growths were more apparent on the fifth day, being slightly raised, with a cream-colored center and a dark brown periphery. The colonies then became black and coalesced to form a cerebriform or verrucous growth. Microscopically the organism was identified as the fungus Sporotrichum schencki, showing the characteristic spherical, ovoid or piriform conidia, pedicellate or sessile, single or in groups.

Diagnosis.—A diagnosis of lymphangitic sporotrichosis of the subcutaneous, ulcerating, gummatous type was made.

Progress.—The patient was given 10 drops of saturated solution of potassium iodide three times a day. After the fourth day each dose was increased daily by 1 drop (3 drops total daily increment). An ointment containing 4 per cent bismuth tribromphenate in white petrolatum was applied locally. The lesions improved with this form of therapy and two months later showed great improvement, with no evidence of activity. There was, however, evidence of scar formation.

TRAUMATIC MARGINAL ALOPECIA DUE TO TRACTION ON THE HAIR

A COMPARATIVE STUDY OF ALOPECIA LIMINARIS FRONTALIS OF SABOURAUD

OSWALDO G. COSTA, M.D.
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AND
MOACYR A. JUNQUEIRA, M.D.
Assistant to the Professor of Pathologic Anatomy of the Faculty of Medicine, University of Minas Geraes, and Pathologist of the Raul Soares Institute
BELLO HORIZONTE, BRAZIL

Ribeiro [1] in 1937 described, under the name of traumatic marginal alopecia, a type of alopecia observed in Negro and in mulatto women. The name given to this type of alopecia is justified by its localization at some point of the periphery of the hairy scalp and by its traumatic origin. The frequency of this type of alopecia is extraordinary in those states of Brazil in which Negroes and mulattoes are numerous. Of 100 Negro women examined at random (excluding mulattoes) the condition was present in 55 in typical discrete, early or advanced form. We found also that Negro women were attacked oftener than mulattoes, but not a single case was recorded among white women.

The symptoms of traumatic marginal alopecia as determined by one of us (O. G. C.) coincide exactly with those described by Ribeiro.[1] Negresses and mulattoes in order to hide the characteristic wooly arrangement of their hair try to dress it as white women do. They stretch their hair and try to keep it in this unnatural position by means of hairpins, combs, ribbons, plaits of hair and kerchiefs placed on the hairy scalp. This procedure results in traumatic marginal alopecia, which generally occurs as triangular patches arranged symmetrically in front of and slightly above the ear (fig. 1).

The inferior angle of these patches is situated at the point where in the male the hair on the scalp is continuous with the beard, and the sides of the triangle are formed by a border of peripheral hair. The base of the triangle consists of the insertions of the long hairs pulled upward and maintained in position by hairpins, combs and so on (fig. 2). Many of the hairs which form the border are normal at their extremities, showing that they were neither cut nor broken. The border of hair, situated at the margin of the hairy scalp remains intact, since the short hairs of the periphery escape from the comb and so are not subjected to constant traction. The aspect of the affected patches varies according to whether the alopecia is of long standing or not. When it is of recent origin the surface is covered with short hairs which are beginning to grow alongside longer ones. The follicular orifices, recently emptied, are wide open. The substitution and growth of the hair take place normally, and the patch of alopecia persists only because each hair on reaching a certain length is again pulled out in the act of combing or

1. Ribeiro, H.: Alopécia marginal traumatica por tracção dos cabelos, Brasil-med. **52**: 1267-1271, 1937; Alopécie marginale traumatique, Ann. de dermat. et syph. **6**:495-503, 1938.

after a few days of stretching. If the patient continues to pull out the hair or keep it stretched, the alopecia progresses slowly and becomes permanent through follicular sclerosis or atrophy. If the cause does not persist the alopecia disappears without leaving any trace; when the traumatism is of long standing, as is generally the case in women over 40, the follicles undergo atrophy, and those which are not

Fig. 1.—Alopecia of the frontotemporal region.

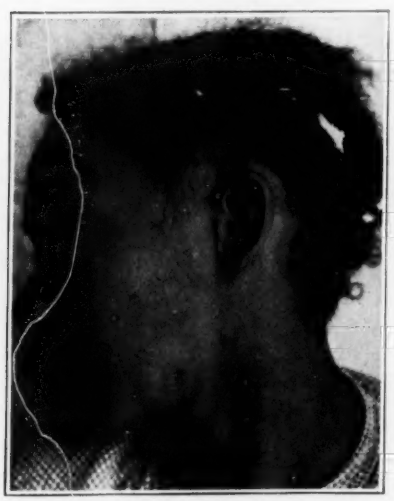

Fig. 2.—Localized area of alopecia of the frontotemporal region in a girl 13 years of age. The marginal hairs are long, those in the center of the patch being shorter and sparser. The normal hairs are plaited and held back by hairpins and ribbons.

completely destroyed can produce only short, weak hairs. In such circumstances there occurs a variety of incomplete alopecia just behind the frontotemporal seborrheic triangle but quite distinct from it. There are no inflammatory symptoms. The follicular orifices are slightly squamous. Traumatic marginal alopecia is not, however, confined to those parts of the hairy scalp just mentioned. It

may be found in any part of the margin, always, however, being characteristically limited by that margin. Thus the condition may extend to the occipital or frontal region. When it reaches the frontal region or is confined to it, the appearance is that of alopecia liminaris frontalis, described by Sabouraud.[2] One of us (O. G. C.) has recorded 3 cases in which the alopecia invaded the whole circumference of the cephalic margin, including the frontal, temporal and occipital regions, constituting a true alopecia liminaris ophiasiformis similar to ophiasis Celsi (figs. 3 and 4). It must be emphasized that all these abnormal forms are caused by methods of hair-dressing whose object is to straighten the hair.

The age at which traumatic marginal alopecia appears depends on the age at which the use of artificial hair-straightening methods is begun; we have seen a girl of 11 months with typical alopecia.

We have never encountered the disease among white women, but Ribeiro [1] has recorded 1 case.

We have been unable to obtain the paper of Argüelles Casals [3] on traumatic marginal alopecia due to traction on the hair.

In some cases traumatic marginal alopecia shows certain affinities with alopecia liminaris frontalis as described by Sabouraud,[2] and a comparative study of the two conditions is interesting.

According to Sabouraud [2] alopecia liminaris frontalis is represented by a roughly triangular patch which never includes the marginal hairs of the scalp. These patches are symmetric, smooth, slightly depressed, cicatricial and irregular, with a few healthy isolated hairs in their central part. These triangular patches may be joined by a narrow strip running round the forehead. In the advanced stages no inflammatory symptoms, crusts, redness or red follicular mottling can be observed. Sabouraud referred also to atypical cases but not to abnormal localization. In 1933 Louste and Rabut [4] recorded 2 cases in girls of 9 and 11, but the description of these authors differs slightly from that of Sabouraud, since they mentioned the occurrence of follicular pustules, essential linear erythema and abnormal evolution.

As regards the etiologic factor of alopecia liminaris frontalis, Sabouraud [2] expressed the opinion that it was a morbid condition of unknown origin. Balina [5] and Uriburú,[6] who indeed were the first to mention the possibility of traumatism as a causal factor, expressed the opinion that the alopecia results from strong constant traction made on the hair roots by "bigoudis" which certain young women are in the habit of wearing to smooth out their hair. Sezary and Rabut [7] expressed the opinion that the condition is due to a staphylococcic folliculitis brought about by traumatism following the use of "bigoudis."

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2. Sabouraud, R., in Darier, J., and others: Nouvelle pratique dermatologique, Paris, Masson & Cie, 1936, pt. 7, p. 13; De l'alopécie liminaire frontale, Ann. de dermat. et syph. **4**:446-460, 1931; Diagnostic et traitement des affections du cuir chevelu, Paris, Masson & Cie, 1932, p. 398; Pelades et alopécies en aires, ibid., 1929, p. 93.

3. Argüelles Casals, D.: Alopecía marginal traumática, Rev. de cien. méd. **1**:133-134, 1938.

4. Louste, A., and Rabut, R.: Alopécie liminaire frontale, Bull. Soc. franç. de dermat. et syph. **40**:564-566, 1933.

5. Balina, P. L.: (*a*) Alopécie liminaire de sabouraud, Bull. Soc. franç. de dermat. et syph. **40**:1277-1279, 1933; (*b*) Alopecia sendotiñosa de causa traumatica e insolita, sus probables relaciones com la alopecia "liminaire" de Sabouraud, Rev. argent. derm. sif. **16**:599-604, 1932; (*c*) Nuevo caso de alopecia liminar traumatica, ibid. **21**:31, 1935.

6. Uriburú, J. V., cited by Balina.[5a]

7. Sezary, A., and Rabut, R.: Alopécie liminaire traumatique (traction par bigoudis), Bull. Soc. franç. de dermat. et syph. **44**:380-381, 1937.

Spencer [8] concluded that "the custom of arranging the hair in tightly drawn braids causes a traumatic folliculitis of the scalp and is a probable cause of alopecia liminaris frontalis." Louste and Rabut [4] isolated Staphylococcus aureus from the

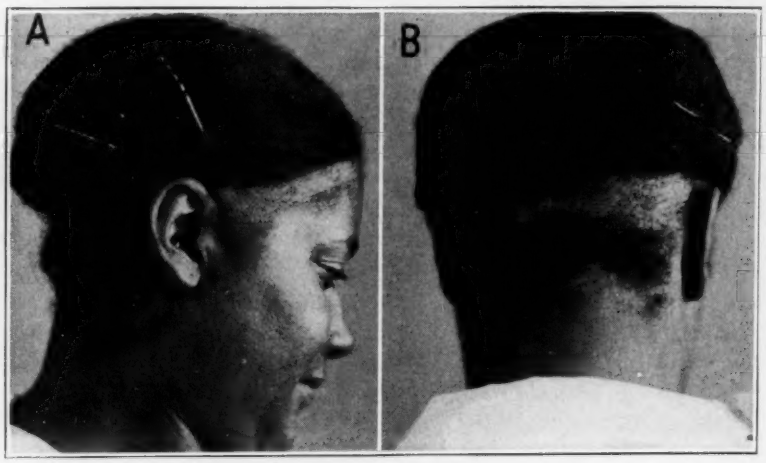

Fig. 3.—*A*, traumatic marginal alopecia including the entire circumference of the scalp. The normal hair is stretched back by metallic hairpins. The hairs in the affected area are sparse and short, but there is no evidence of inflammation. *B*, back view of the same patient.

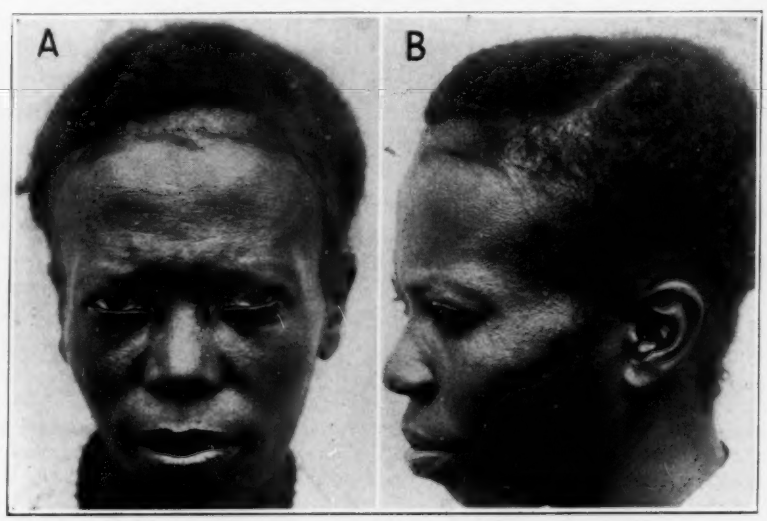

Fig. 4.—*A*, alopecia of the frontal region, also extending in "ophiasis" fashion around the entire scalp. *B*, side view of the same patient.

lesions of their patients, but expressed the opinion that the cause of the lesion may be traumatism. Thibaut [9] expressed the opinion that the linear aspect of the pre-

8. Spencer, G. A.: Alopecia liminaris frontalis, Arch. Dermat. & Syph. **44**:1082-1085 (Dec.) 1941.

9. Thibaut, cited by Louste and Rabut.[4]

dominant lesion may be determined by traumatism. Sutton and Sutton [10] stated that "this syndrome as a whole is probably an avitaminotic or endocrine affection."

As regards the frequency of the malady Sabouraud [11] declared that he had encountered only 10 or 12 cases in thirty years. Lévy-Franckel [12] and Rabut [13] expressed the opinion that this type of alopecia is rare. McCarthy [14] expressed the opinion that in the great dermatologic clinics 2 or 3 cases a month may be noted when a careful examination is made.

According to Spencer,[8] in the clinic of the Harlem Hospital of New York, where the majority of the patients are Negroes, 1 or 2 cases are observed weekly.

Alopecia liminaris frontalis has been observed only in females with the exception of 1 of Schmidt's cases,[15] which in McCarthy's [14] opinion was an example of frontal band alopecia.

With 2 exceptions in the cases recorded by Sabouraud [16] the disease occurred in fully mature or old women, but other observers have recorded cases of its development in young women.

The disease attacks both white and Negro women, and the morbid process evolves till a definitive and therefore incurable atrophy takes place. When one knows the characteristics of these two types of alopecia, that is, traumatic marginal alopecia as described by Ribeiro [1] and caused by traction on the hair, and alopecia liminaris frontalis, it is easy to make a comparative study of the two diseases. The symptoms of the two are identical in certain cases, and, as has been mentioned, the traumatic causation of alopecia liminaris frontalis has been asserted by various observers except Sutton and Sutton [10] and Sabouraud.[2] As regards the unequal frequency of the two types as noted by different observers, it must be emphasized that the percentage of Negroes and mulattoes is extremely low or almost nil in France, in the Argentine and even in Rio Grande do Sul (Brazil), where Ribeiro recorded his cases. It is true that there is also a great difference between the frequency recorded by us and that encountered in the United States by Spencer [8] in the Harlem Hospital, where Negro women predominate. We do not know if Negro women in the United States abuse artificial means of stretching and straightening the hair as do Negro women in Brazil. As regards white women, these only use "bigoudis" at longer or shorter intervals in order to curl the hair, and they are on the lookout for the slightest sign of falling out of the hair.

With the exception of Schmidt's case, the two types of alopecia were seen only in females. As regards the age of the patients and the evolution and prognosis, traumatic marginal alopecia is identical in certain cases with alopecia liminaris frontalis. The fact that alopecia liminaris frontalis is sometimes identical with traumatic marginal alopecia caused by traction on the hair constitutes a strong argument in favor of Balina's [5] theory which affirms the traumatic origin of the disease described by Sabouraud.[2] We also are of the opinion that repeated daily traction will in course of time bring on a condition of traumatic folliculitis resulting in alopecia.

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10. Sutton, R. L., and Sutton, R. L., Jr.: Diseases of the Skin, ed. 10, St. Louis, C. V. Mosby Company, 1939, p. 1399.

11. Sabouraud, R.: De l'alopécie liminaire frontale, Ann. de dermat. et syph. **4**:450, 1931.

12. Lévy-Franckel, A., in Belot, J., and others: Traité de dermatologie clinique et thérapeutique, Paris, G. Doin & Cie, 1933, vol. 2, pt. 2, p. 398.

13. Rabut, R.: Dermatologie, in Laffont, A., and Durieux, F.: Encyclopédie médico-chirurgicale, Paris, 1936, vol. 18, pt. 2, p. 12088.

14. McCarthy, L.: Diagnosis and Treatment of Diseases of the Hair, St. Louis, C. V. Mosby Company, 1940, p. 288.

15. Schmidt, F.: Alopecia liminaris frontalis, Dermat. Wchnschr. **103**:1627, 1936.

16. Sabouraud, R.: De l'alopécie liminaire frontale, Ann. de dermat. et syph. **4**:451, 1931.

A histologic examination of tissue from an area of alopecia in one of our patients, aged 40, showed the following picture: The epidermis was thinned out, the stratum corneum loose and easily cleft into thin layers. The stratum granulosum was formed of only one or two layers of cells. The rete malpighii was also thin and showed two to four layers of cells. The interpapullary crests were thin and rather long. The basal layer was hyperpigmented. Some chromatophores were seen in the subpapillary layers of the dermis. Only one hair root longitudinally split was seen in the whole preparation, but there were two transversely cut, and all three were extremely thin. Near the sebaceous glands annexed to the hair, there was a discrete infiltration of round cells. The sweat glands showed nothing of note.

SUMMARY

We have reported cases of the traumatic marginal alopecia due to traction on the hair, first described by Ribeiro [1] in Negro and mulatto women. We have found that the traumatism is produced by continuous traction on the hair through the use of a great variety of artificial means of disguising the kinkiness which is characteristic of the hair of Negroes and mulattoes. In young women the cessation of the traction is enough to determine the "restitutio ad integrum," but in advanced stages of the disease, especially in persons over 40, incurable atrophic cicatricial alopecia results. Traumatic marginal alopecia of the frontal type may appear under the clinical aspect of alopecia liminaris frontalis, and this constitutes an argument in favor of its traumatic origin, as suggested by Balina.[5]

We are of the same opinion as Ribeiro,[17] namely, that white women may, independently of the use of hairpins, "bigoudis," etc., suffer from a form of alopecia liminaris frontalis due to long-continued backward traction on the hair, as from a "bun."

We believe, after a perusal of the available literature, that the localization of traumatic marginal alopecia, like that of ophiasis Celsi, verified by one of us (O. G. C.), has not yet been described.

Rua Ceará, 1695.

Rua Ourissanga, 78.

17. Ribeiro, H.: Alopécie marginale traumatique, Ann. de dermat. et syph. **6**:501, 1938.

Clinical Notes

PREVENTION OF RINGWORM OF THE SCALP IN CHILDREN

FRITZ B. REIF, M.D., NIAGARA FALLS, N. Y.

A highly communicable disease among children is infection of the scalp with Microsporon audouini. According to Darier, the infection may be direct, by contact, or more frequently indirect, by use of toilet utensils, etc. Spreading of the infection among children of the same family is common.

During the past three years, a considerable number of microsporon infections have been observed among school children in a certain district of Niagara Falls, N. Y. In spite of medical examinations in the schools, the infection could not be eradicated. As a rule, only one child in each family became infected. In view of the facts that in some instances infections were initiated during the summer vacation and that preschool children were attacked, it would appear that contact in the schools could be eliminated as the primary source of infection in these cases.

A more probable means by which the infection is transferred from one child to another appears to be the backs of seats in movie theaters. This hypothesis is borne out by the fact that the primary infection in my series of cases was located almost exclusively on the upper part of the occiput. Careful observation by the mother of 1 of my patients substantiated the theory that the infection was possibly transmitted by leaning the head against the infected back of a seat.

It would be impractical to take swabs from the upholstery of movie seats in search for infected hair. An inexpensive and effective preventive measure would be disinfection of movie house furniture followed by protection of the backs of the chairs with paper covers which could be periodically renewed.

Pine and Main streets.

A SIMPLIFIED METHOD FOR STAINING FUNGI IN SKIN AND IN NAILS

ERNST BERNHARDT, M.D., BOSTON

Commonly fungi have been demonstrated microscopically in skin scrapings and nail shavings by maceration of the material in solution of potassium hydroxide.

Langeron's [1] method of staining fungi in a solution of cotton blue in Amann's [2] lactophenol was adapted by Swartz and Conant [3] for macerated specimens. In order to remove the alkali they transferred the material to a watchglass containing water. It is difficult to return the small particles to the slide, and hyphae may be lost in the water bath.

Schubert [4] prolonged and complicated the method by extending the rinsing time to a period of hours and centrifuging and collecting the scales on a wire net. He assumed that thorough rinsing was necessary in order to obtain well stained specimens. That this was an error was shown in the following experiment:

A drop of cotton of blue–lactophenol placed on the rim of the cover slip drives out the alkali. A piece of blotting paper held to the opposite rim first draws off colorless alkali, then a

From the Department of Dermatology and Syphilology (Dr. Joseph Goodman), Beth Israel Hospital.

1. Langeron, M.: Précis de microscopie, Paris, Masson & Cie, 1913, p. 712.

2. Amann, J.: Konservierungsfluessigkeiten und Einschlussmedien, Ztschr. f. wissensch. Mikr. **13**:18-19, 1896.

3. Swartz, J. H., and Conant, N. F.: Direct Microscopic Examination of the Skin, Arch. Dermat. & Syph. **33**:291-305 (Feb.) 1936.

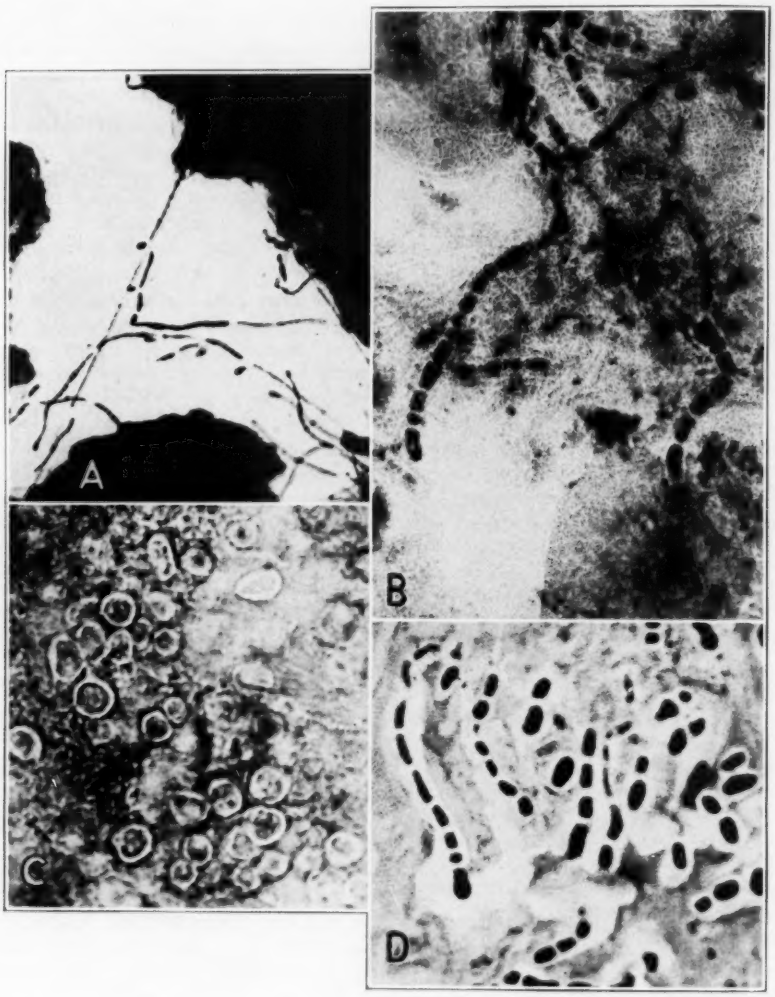
4. Schubert, M.: Zur Faerbung der Hautpilze, Dermat. Wchnschr. **105**:1025, 1937.

pink liquid consisting of cotton blue in alkaline solution and finally the unchanged blue stain in acid solution.

Mitchell [5] complained of failures in attempts to use Swartz and Conant's method, i. e. crystal formation and faulty staining. Crystals form only if the water content increases to more than 50 per cent. Understaining and overstaining occur in preparations that have not been pressed thin enough to attain complete transparency.

In consideration of the points mentioned the following procedure is recommended:

Place on a slide a small particle of the material (not exceeding 2 by 2 by 0.2 mm.). Macerate in 10 per cent solution of potassium hydroxide. Cover. Remove excess alkali by



A, from erosio interdigitalis (culture: Monilia albicans). *B*, from tinea cruris (culture: Trichophyton rubrum). The specimen was one year old when photographed. *C*, chlamydospores in brittle mass from onychomycosis (culture: Epidermophyton interdigitale). There is an unstained (senile) spore in the upper right quadrant. *D*, Achorion schoenleinii in crust from the scalp.

firm pressure under blotting paper. Maceration is certainly incomplete if the specimen tends to slip out or if air invades the covered space.

5. Mitchell, J. H., in discussion on Swartz and Conant,[3] p. 303.

Flood the specimen with a drop of cotton blue–lactophenol and heat it gently, blotting off excess stain from the opposite rim. Then press it firmly under blotting paper.

Microscopic examination shows the objects on a slightly bluish background. Flooding the specimen with clear lactophenol removes the last traces of excess stain.

Lactophenol is composed of 1 part each of phenol crystals, lactic acid syrup and water and 2 parts of glycerin.

The staining solution is made up by adding 0.5 per cent of cotton blue Poirrier [6] to the lactophenol. Dissolve and filter.

The method described has been successfully used clinically for more than a year in staining fungi in macerated material from the skin and nails. Results are shown in the accompanying photomicrographs.

Particularly in chronic mycotic processes fungous elements are found that do not take the stain. They remain distinctly visible, since lactophenol is an excellent preservative.

Specimens sealed with Noyer's [7] cement did not show appreciable fading after one year of storage. Evaporation occurred in unsealed slides. They could be restained.

SUMMARY

A simplified and improved method of staining fungi in macerated skin and nail preparations is presented. Minute technical rules are given.

370 Commonwealth Avenue, Boston 15.

6. Cotton blue Poirrier may be obtained from the National Aniline Division of the Allied Chemical & Dye Corporation, New York.

7. Langeron,[1] 1925, p. 547.

News and Comment

GENERAL NEWS

Dr. John Butler, of Minneapolis, associate professor of dermatology, University of Minnesota Medical School, died on Sept. 17, 1943.

Section on Dermatology and Syphilology of the American Medical Association.—Applications for places on the program of the Section on Dermatology and Syphilology of the American Medical Association for the next annual session to be held at Chicago, June 12 to 16, 1944, are now being received. All Fellows of the American Medical Association are eligible. Essayists who are not Fellows of the American Medical Association may be accepted by invitation. Applications should be addressed to Dr. Nelson Paul Anderson, Secretary of the Section on Dermatology and Syphilology, 2007 Wilshire Boulevard, Los Angeles 5, Calif.

Because of the lateness of this announcement, the closing date for applications has been extended to Dec. 31, 1943.

Course of Lectures on Occupational Dermatoses.—Plans are now complete for the third course on occupational dermatoses, to be given at the New York Academy of Medicine from December 6 to 11 inclusive. The courses will consist of twelve two hour lectures illustrated by lantern slides, lectures are scheduled to be given from 10 a. m. to 12 m. and from 2 to 4 p. m. each day.

While the course is primarily intended for industrial physicians of ordnance plants operated by the Army and Navy, physicians of privately operated ordnance plants financed by the government and medical officers of state industrial hygiene units, there will be room for other physicians who may wish to take the course.

Physicians who desire to take the course may apply directly to Medical Director Louis Schwartz, Chief, Dermatoses Investigations Section, National Institute of Health, Bethesda, Md. A registration card will be sent to them, and a card of admission will be sent to those who register.

It is requested that physicians attending the course report at the Academy of Medicine, 2 East One Hundred and Third Street, New York, at 8:30 a. m. December 6, in order that their admission cards may be validated.

Obituaries

JOSEPH SELLEI, M.D.
1871–1943

Dr. Joseph Sellei was born in Timişoara, Hungary, in 1871. He completed his secondary school and university studies at Budapest and specialized in dermatology as a young physician. He became head of the department of dermatology of the hospital of the Hungarian State Railways and of the Charité Policlinic in Budapest, which positions he held until his departure to the United States.

He was one of the founders and the first vice president of the Hungarian Dermatological Society and was elected honorary member of various foreign dermatologic societies.

He wrote several textbooks on dermatology and venereal diseases, which were generally used at the Hungarian universities, and his publications in various medical journals covered a broad field of dermatology. In the past fifteen years, his main fields of research were the effects of ferments on ulcers, the proper definition of scleroderma and its possible medical treatment and the effect of fluorescent dyes on plant growth. Although the last seems to be remote from dermatology, he became interested in it during experiments to prove the stimulating action of various materials on cell growth. His discoveries in this field caused him to come to America, where he was invited by a company interested in plant growth. He wanted to undertake experiments under different climatic conditions from those in California, and moved to Chicago after finishing experimentation on the West Coast in 1942. Illness hindered fulfilment of his plans.

With an active mind and still many plans for the future, he died in Chicago, on Sept. 27, 1943, after two days of suffering from a heart attack.

Correspondence

HYPERHIDROSIS OF THE FEET

To the Editor:—In the issue of the ARCHIVES for June 1943 there appears a paper under the title "Symmetric Lividity of the Soles," by Captain L. M. Nelson. The eruption described corresponds so closely to one of the commonest dermatoses affecting servicemen in the Middle East that I am impelled to add some remarks on our experience with it over the last three years. The great frequency of the disease under military conditions is in striking contrast to the paucity of references to it in the literature.

The lividity (or erythema) referred to is only one of three main features of the eruption, the other two being excessive sweating and hyperkeratosis. Since sweating is the most constant manifestation, the dermatosis has usually been labeled "hyperhidrosis" or, more colloquially, "scalded feet."

Since, however, erythema or keratosis may occur without hyperhidrosis in some cases, it seems likely that none of the three features is primary and that all are effects of some underlying disease.

Clinical Features.—1. Erythema: This affects the pressure areas of the foot; that is, the heel, the outer border of the sole, the anterior arch and the ventral surface of the toes where they are in contact with the shoe.

2. Hyperkeratosis: Hyperkeratosis also favors the same areas, but as a result of the pressure it does not project above the surface except at the edges of these areas, where it may be pronounced. Localized keratoses are often seen filling the spaces between the toes on their ventral surfaces, and these may give rise to a good deal of pain.

3. Hyperhidrosis: Sweating may become so severe that the feet run with sweat even when they are bare. When the man has boots on, the sweat macerates the horny layer, causing a sodden, whitish discoloration on the parts of greatest pressure and between the toes. This change may lead to the eruption's being labeled tinea and being treated with strong fungicides, which make it worse. In the areas of greatest pressure, especially on the heels, there are small translucent "sago grain" areas which look like deep-seated vesicles.

4. Symptoms: The chief complaint is of a burning sensation, which is a real disability. It is worse with boots on, particularly after marching. Lighter shoes give some relief, and open sandals are best of all. Rubber shoes are no better than boots.

5. Atypical Manifestations: In typical cases all of the aforementioned features are shown, but any of them may be absent. Sometimes erythema without sweating is seen, and the only complaint is the burning sensation. Hyperkeratosis is the least common feature, and it occurs alone only in exceptional cases. Hyperhidrosis of mild degree without the other features is often seen.

6. Palms: A similar condition may affect the palms, consisting of erythema, hyperhidrosis and desquamation without hyperkeratosis. It is most severe on the ventral surfaces of the terminal phalanges.

Etiology.—The following views on causation were expressed by Lieutenant Colonel B. C. Tate, R. A. M. C., adviser in dermatology to the Middle East forces, in a personal communication (1942):

The cause of the keratosis in these cases is rather obscure. My own view is that it is not due to sweating, but that the sweating and keratosis both depend on some underlying toxemia. The combination of these two conditions is not infrequently associated with rheumatism. I have known of several instances in which the feet became dry and the keratosis disappeared after removal of septic foci, but it is not always possible to find such a focus.

In my own cases the following factors have been observed:

1. Constitutional: Most of the patients have the "seborrheic" diathesis, being unduly susceptible to infective, circulatory and sensory as well as secretory disturbances of the skin. Those with the more severe manifestations have had lesser degrees of the same trouble all their lives.

2. Environmental: In other cases there has been no previous history and the disease dates from enlistment. In others it begins only when the man arrives in the Middle East, where all manifestations of the seborrheic state tend to be worse. It is not the heat alone which is responsible, since the disease persists through the winter here, although it is more severe in the summer.

3. Psychoneurotic: In many cases a psychoneurosis is an underlying factor, and on physiologic grounds it is easy to see how a chronic anxiety state can influence sweating of the palms and soles.

4. Toxic: It is common to find infective processes in association with the dermatosis, but only in occasional cases is it possible to remove the source, e. g., teeth and tonsils. More often there is a chronic sinusitis, dysentery, bronchitis, or otitis media which cannot be completely eradicated under service conditions.

Prognosis and Treatment.—If the patient can wear a suitable type of footwear he may be all right. Rest in bed produces a rapid return to normal. Persons with the worst forms are totally incapacitated for service, and they have to be invalided home.

Etiologic therapy is only occasionally possible. When an intercurrent acute infection, such as a nasal cold, acute tonsillitis or acute dysentery, is responsible, the eruption disappears. Unless there is a removable chronic focus of sepsis, palliative measures are all that can be offered.

My colleagues and I use the following routine: twice daily antiseptic soaks, for which a warm solution of potassium permanganate (1:4,000) is the best preparation. The feet are soaked for ten to fifteen minutes and are allowed to dry thoroughly afterward. This should leave a brown tan on the skin; if not, it means that it is not being done correctly or that sweating is so profuse that it immediately washes the stain off the skin. The feet and socks are then well dusted with 3 per cent salicylic acid in talc.

This controls the disease in the usual forms. The milder forms may be relieved by use of:

	Gm. or Cc.
Methenamine	0.5
Tragacanth	0.5
Talc	25.0
Water	74.0

This makes a creamy lotion which is easy to spread over the feet and leaves a liberal residue of powder on drying. Action of the acid sweat on the methenamine liberates formaldehyde, which inhibits bacterial growth and hardens the skin, preventing maceration.

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CHRONIC SCARRING PSEUDOFOLLICULITIS OF THE NEGRO BEARD

To the Editor:—After my paper on "Chronic Scarring Pseudofolliculitis of the Negro Beard" (Arch. Dermat. & Syph. **47**:782-792 [June] 1943) had been published, it was called to my attention that two other American authors had written on this and related subjects. I greatly regret that my search of the literature has proved to be so incomplete, and I should like to give credit where credit is due, particularly as Dr. S. S. Greenbaum has raised the question of priority in the September issue of the Archives.

Dubreuilh's[1] paper of 1922 is doubtless the first one which called attention to a peculiar type of ingrown hairs which in 2 cases had caused a rather severe inflammatory disease of the beard. Dubreuilh called these hairs "poils recourbés." One of his patients was a French mulatto soldier from Guadeloupe.

Four years later, Schmidt,[2] of Chicago, apparently without knowledge of Dubreuilh's work, observed 3 cases of a similar disease in Vienna. Two of the subjects were of the Semitic race; 1 was an Egyptian. Schmidt performed biopsies in his cases and came independently to conclusions similar to those of Dubreuilh. He considered abnormalities of growth of hair due to racial mixture as a predisposing factor. He used the term "pili incarnati."

Two years later, G. Weninger[3] published a report of several more cases. All of the subjects were of the white race, and not all of them presented the pure picture which apparently is characteristic of the disease in persons with negroid hair. Weninger cited Schmidt, but apparently he did not know of Dubreuilh's paper.

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1. Dubreuilh, M. W.: Eruption papuleuse de la barbe causée par le recourbement des poils, Bull. Soc. franç. de dermat. et syph. **29**:80-81, 1922.

2. Schmidt, Frederick R.: Ueber eingewachsene Barthaare, Dermat. Ztschr. **48**:278-285, 1926.

3. Weninger, G.: Sur les poils incarnés, Ann. de dermat. et syph. **9**:687-694, 1928.

Dr. S. S. Greenbaum [4] deserves credit for having first described the typical clinical picture in the North American Negro. Unfortunately, he was led to a pathologic interpretation which is expressed in his designation "folliculitis barbae traumatica" and which is at variance with the observations of all the other authors.

It seems to me, as I wrote in my article, that priority in every respect belongs to Dubreuilh, who gave a lucid description of the clinical and pathogenic features of this variety of ingrown hairs in a native of the western hemisphere who in American usage would be called a Negro.

In my own discussion of the subject I was particularly interested in the anatomic and pathologic differences between "white" and "Negro" hair and, in the clinical field, in the chronicity and eventual disfigurement by scarring which characterize pseudofolliculitis.

HERMANN PINKUS, M.D., Monroe, Mich.

ACUTE DERMATITIS DUE TO HAIR LACQUER

To the Editor:—In the past two weeks I have seen 5 patients who were suffering from an acute dermatitis resulting from the use of a "lacquer material" on the hair. The material is employed for the purpose of keeping the "up-swept hair-do" in place. It was either sprayed on or applied by means of pads which had been dipped in the lacquer. Some of the patients claimed to have used such applications for two years without any difficulty.

The earliest symptom is an itching on the ears, soon followed by an eruption of tiny slightly erythematous vesicles. Subsequently the face and neck tend to become involved, with all of the manifestations of an acute dermatitis. Cosmeticians who applied the lacquer claim that some difference in composition has been made in recent available material. Food and drug authorities state that the dermatitis is probably caused by a synthetic gum which is now used to replace a natural gum.

The purpose of this communication is to make dermatologists aware of the possible danger from the use of lacquers and to supply a brief picture of the dermatologic manifestations.

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1020 South West Taylor Street.

4. Greenbaum, S. S.: Folliculitis Barbae Traumatica, Arch. Dermat. & Syph. **32**:237-241 (Aug.) 1935.

CORRECTION

In the article by Frank H. Moult, M.Sc., entitled "Histopathology of Rat Skin in Avitaminosis A," in the June issue (ARCH. DERMAT. & SYPH. **47**:768, 1943), the magnification in the legends for some of the illustrations is incorrect; i. e., in figures 2, 3, 4 *A* and 4 *C* the magnification should be "× 250" instead of "× 120," and in the legend for figure 4 *B* the magnification should be "× 50" instead of "× 501."

Abstracts from Current Literature

EDITED BY DR. HERBERT RATTNER

COMPLEMENT FIXATION FOR LYMPHOGRANULOMA VENEREUM AND FOR PSITTACOSIS WITH FREI REACTIONS AMONG PNEUMONIA PATIENTS. SONNIA LEVINE, ERNEST C. HOLDER and JESSE G. M. BULLOWA, J. Immunol. **46**:183 (April) 1943.

The authors surveyed the occurrence of positive reactions to the Frei test in patients with pneumococcic pneumonia (96 per cent Negroes) who gave neither clinical symptoms nor a history of lymphogranuloma venereum and checked them by complement fixation with chick embryo antigen (an inactivated suspension of the elementary bodies of the virus of lymphogranuloma venereum) and psittacosis antigen. Suitable controls from persons with positive Frei reactions and clinical symptoms of lymphogranuloma venereum and patients with negative Frei reactions were employed.

Complement fixation with chick embryo antigen occurred with serums from patients with positive Frei reactions who showed symptoms of lymphogranuloma venereum infection and with serums from patients with positive Frei reactions who had neither symptoms nor a past history of infection. Eighteen persons without manifest disease who had positive Frei reactions were found in 175 patients with pneumococcic pneumonia. Cross complement fixation reactions have been demonstrated with the antigens of lymphogranuloma venereum and psittacosis viruses. Therefore, for the diagnosis of lymphogranuloma venereum, complement fixation must be corroborated by a positive Frei reaction. In the absence of a positive Frei reaction positive complement fixation with chick embryo antigen may indicate the presence of psittacosis or allied virus infection.

HISTOLOGIC STUDIES OF REACTIONS TO INTRACUTANEOUS TESTS IN ALLERGY OF INFECTION IN HUMANS. FRANCES PASCHER, MARION B. SULZBERGER and DAVID L. SATENSTEIN, J. Immunol. **46**:195 (April) 1943.

The authors studied the histologic changes of the positive cutaneous test in allergy of infection to note whether different specific antigens elicit histologic changes characteristic of the particular antigen employed. To determine this, trichophytin, oidiomycin, old tuberculin Koch and the purified protein derivative of tuberculin were injected intracutaneously into human subjects and a comparative study of the histologic changes at the test sites was made. The study was only of the so-called "delayed positive" response (papular, twenty-four to forty-eight hour, tuberculin-trichophytin-type reaction) to the intracutaneous injection of specific antigens, since this response is seen as typical of the usual sensitization in man on adequate exposure to a great number of different living agents of disease.

They found that the histologic response to the intracutaneous injections of old tuberculin, purified protein derivative, oidiomycin and trichophytin was uniform during the first ten days after injection, banal and not characteristic of any particular extract. The histologic response at two weeks to five weeks after the injection of the specific antigens varied. Tubercles and tuberculoid structures were elicited with old tuberculin and purified protein derivative but not with oidiomycin or trichophytin (except in 1 instance in response to trichophytin in which the histologic picture was suggestive of tuberculoid structure). A period of at least two weeks was required for the formation of tubercles and tuberculoid structures. In some instances the histologic reactions at sites of tests with old tuberculin and with purified protein derivative resembled lupus vulgaris, in others erythema induratum and in 1 instance granuloma annulare. Tubercles or tuberculoid structures cannot be regarded as the typical histologic response to injections of specific antigens in all forms of allergy of infection.

A HISTOPATHOLOGIC STUDY OF THE MODE OF ACTION OF SULFAPYRIDINE. CLARENCE C. LUSHBAUGH and PAUL R. CANNON, J. Infect. Dis. **71**:33 (July-Aug.) 1942.

The authors made a histologic study of the pneumococcic dermal lesions of untreated and of sulfapyridine-treated rabbits. They found that the drug acts directly on the pneumococci so that their accumulation in the blood and other tissues is inhibited and that the effect of the drug, presumably, is on the bacterial cell body rather than the capsule. They saw no evidence that phagocytosis plays the conspicuous role in the disposal of the organisms that it does in acquired immunity. The conclusion seemed to them warranted that in the pneumococcic

dermal lesion of the rabbit the forces of chemotherapy and of acquired immunity differ as defense mechanisms but act as complementary forces in tending to terminate the infection.

THE EFFECT OF TEMPERATURE UPON THE GROWTH AND SURVIVAL OF MYXOMA, HERPES, AND VACCINIA VIRUSES IN TISSUE CULTURE. RANDALL L. THOMPSON and MARGARET S. COATES, J. Infect. Dis. **71**:83 (July-Aug.) 1942.

The growth of filtrable viruses is associated with living tissues. In all living organisms one of the most important limiting factors for growth is temperature, and in most acute diseases, including many of those caused by viruses, fever is a prominent symptom. It is important, therefore, to determine the effect of an elevation of temperature on the growth and survival of infective agents. For those viruses which will grow in tissue cultures, such information may be obtained by the incubation of cultures at different temperatures and the measurement of the resulting virus content. For others susceptible animals may be inoculated and kept in a warm room. In some cases both methods may be used. The result of the animal inoculation procedure more closely reproduces the fever associated with naturally occurring virus diseases, but its use is limited by the fact that many experimental animals are unable to withstand an external temperature much greater than their normal body temperature.

In the experiments reported by the authors, the effect of temperature on the growth and survival of myxoma, herpes and vaccinia viruses was determined for tissue cultures. They suspended minced chick embryonic tissue in a mixture of serum and Tyrode's solution and dispensed it in large test tubes for their study of growth and survival of myxoma, herpes and vaccinia viruses at different temperatures. The maximum growth of each virus occurs between 34 and 35 C. in cultures incubated for four days. Herpes virus was not demonstrated in cultures incubated at 40.2 C.; myxoma virus did not survive at 42.2 C. The New York Board of Health and the Noguchi strains of vaccinia virus remained viable in cultures incubated at 45.1 C., but the second revived strain failed to survive for four days.

THE DEATH OF TUBERCLE BACILLI SUBJECTED TO OXYGEN DEPRIVATION IN THE PRESENCE OF MOISTURE AND OF WARMTH. TRUMAN SQUIRE POTTER, J. Infect. Dis. **71**:220 (Nov.-Dec.) 1942.

Under conditions forcing a nearly total metabolic standstill, some organisms may long survive without appreciable intake. Thus, in a profoundly cold or dry state tubercle bacilli may resist starvation for many months. Freedom from the need to replace body elements under such conditions (by food and oxygen intake) parallels the forced halt in chemical activity of those elements within the organism. There is no report of such freedom in the presence of moisture and of warmth. Potter made a series of appropriate observations and found that human, bovine and avian tubercle bacilli, when severely restricted in oxygen supply in the presence of moisture and of warmth, slowly lose their capacity for subsequent growth, both in culture and in animal tissues.

ASPHYXIATED BACTERIA AS A VACCINE IN TUBERCULOSIS. TRUMAN SQUIRE POTTER, J. Infect. Dis. **71**:232 (Nov.-Dec.) 1942.

The author found that moist, warm avian tubercle bacilli, when completely deprived of virulence by asphyxia without the use of coagulating heat, retain constituents able to confer on the rabbit a decided, though as yet incomplete, protection against infection with virulent avian tubercle bacilli.

MECHANISM OF ACTION OF CERTAIN SULFONAMIDE COMPOUNDS. ALBERT DORFMAN and STEWART A. KOSER, J. Infect. Dis. **71**:241 (Nov.-Dec.) 1942.

While there has been a wide divergence of opinion, a number of the more recent investigations have emphasized the idea that the bacteriostatic properties of sulfonamide compounds are due to interference with certain essential metabolic reactions. Dorfman and Koser pursued this relation further and found that sulfapyridine and sulfathiazole, in contrast to sulfanilamide, inhibit the nicotinic acid amide–stimulated respiration of dysentery bacilli when grown on a medium deficient in nicotinic acid amide. This inhibition is not reversed by paraaminobenzoic acid. Quantitative evidence indicates that this inhibition is competitive. Sulfapyridine, sulfathiazole and sulfanilamide all inhibit the growth of dysentery bacilli, but the first two compounds are much more effective in this respect than the last. Inhibition of growth is reversed by paraaminobenzoic acid. The amount of this compound required for reversal is proportional to the concentration of the drug. At a given drug concentration the reversal by paraaminobenzoic acid is related to the concentration of nicotinic acid amide.

On the basis of evidence presented the authors suggest that compounds of the sulfapyridine and sulfathiazole type possess the ability to interfere with certain essential reactions in addition to those inhibited by sulfanilamide.

STUDIES ON THE ACTIVITY OF SODIUM SULFADIAZINE AGAINST BACTERIUM TULARENSE: I. TREATMENT OF EXPERIMENTAL TULAREMIC INFECTION IN THE CHICK EMBRYO. JOHN CHRISTIAN RANSMEIER, J. Infect. Dis. **72**:77 (Jan.-Feb.) 1943.

Because of the relatively low mortality rate of human tularemia and the great and often unpredictable variations in its clinical course, it is difficult from one's own experience or from case reports found in the literature to assess the possible value of various sulfonamide compounds in the treatment of this disease. Since he had not observed a consistent striking response to sulfanilamide or sulfathiazole in human beings and as it was thought that sulfadiazine might possess a wider range of effectiveness than some of its predecessors, the author decided to try this drug in a therapeutic study of experimental tularemia in the chick embryo. He found that sodium sulfadiazine administered intra-amniotically or by way of the chorioallantoic membrane in doses of 10 mg. appeared to exert little, if any, effect on the course of the infection produced in the developing chick embryo by subsequent chorioallantoic inoculation with bacterium tularense.

STUDIES ON THE ACTIVITY OF SODIUM SULFADIAZINE AGAINST BACTERIUM TULARENSE: II. EFFECT ON GROWTH IN VITRO. JOHN CHRISTIAN RANSMEIER, J. Infect. Dis. **72**:83-85 (Jan.-Feb.) 1943.

Although the acid test of chemotherapeutic compounds is their application to the treatment of disease, effects observed in vitro may be of considerable interest. The fastidious requirements of Bacterium tularense make such cultural studies difficult, since at present one is forced to use a complex medium to obtain luxuriant growth of this organism. No satisfactory liquid medium is available. To test the bacteriostatic action of the drug, the author added sodium sulfadiazine to a standard blood-dextrose-cystine agar medium, which is suitable for primary isolation and on which excellent growth on transfer from previous cultures is regularly obtained in twenty-four hours.

He found that sodium sulfadiazine added to slants of blood-dextrose-cystine agar in concentrations of 50, 100 and 200 mg. per hundred cubic centimeters exerted a definite and increasingly pronounced inhibitory effect on the growth of Bact. tularense. There was no inhibition in the presence of 10 or 20 mg. of the drug per hundred cubic centimeters. The amount of hydrogen sulfide produced from such slants was proportional to the degree of growth. Sodium sulfadiazine appeared to exercise no specific effect on this process.

CORNBLEET, Chicago.

STUDIES IN ABNORMAL HUMAN SENSITIVITY TO LIGHT: III. PASSIVE TRANSFER OF LIGHT HYPERSENSITIVITY IN PRURIGO AESTIVALIS. STEPHAN EPSTEIN, J. Invest. Dermat. **5**:285 (Dec.) 1942.

Attempts to cause passive transfer of hypersensitivity to light with the serum from 6 patients suffering from prurigo aestivalis gave positive results in 2 instances: In 1 an urticarial reaction appeared after seven to fifteen hours; in the other a prurigo-like eruption was produced eight and nine days respectively after injection and irradiation.

STUDIES IN ABNORMAL HUMAN SENSITIVITY TO LIGHT: IV. PHOTOALLERGIC CONCEPT OF PRURIGO AESTIVALIS. STEPHAN EPSTEIN, J. Invest. Dermat. **5**:289 (Dec.) 1942.

In abnormal human sensitivity to light one has to differentiate between primary photosensitivity (phototoxicity) and allergic photosensitivity (photoallergy). The results of investigations from the experimental as well as from the clinical standpoint of sensitivity to light and passive transfer in prurigo aestivalis can be satisfactorily explained by the assumption of a photoallergic mechanism, but not on the basis of phototoxicity. In presenting the concept of prurigo aestivalis as a photoallergic dermatosis, it must be admitted that other factors besides sensitivity to light and allergy may contribute to the pathogenesis of this disorder.

ELECTROLYTE CONTENT OF BLISTER FLUID IN PEMPHIGUS. WALTER F. LEVER and JOHN H. TALBOTT, J. Invest. Dermat. **5**:303 (Dec.) 1942.

The concentration of electrolytes in blister fluid and in blood serum was determined for 11 patients with pemphigus vulgaris. By comparison of the amount of the various electrolytes in the blister fluid with the amount in the blood serum it was found that in all but 1 instance the protein and calcium were lower in the blister fluid than in the blood serum. The amounts

of sodium, chloride, potassium, phosphate and nonprotein nitrogen in the blister fluid were higher than the corresponding amounts in the blood serum in some subjects and lower in others. There was, however, a correlation between the ratios blister fluid/blood serum for sodium and for chloride on one side and the ratios for potassium, for phosphate and for nonprotein nitrogen on the other side. In the 3 patients with pemphigus vulgaris acutus the sodium and chloride were lower and the potassium, phosphate and nonprotein nitrogen were higher in the blister fluid than in the blood serum. In the patients with chronic pemphigus vulgaris the sodium and chloride were higher and the potassium, phosphate and nonprotein nitrogen were lower in the blister fluid than in the blood serum.

STUDIES IN THE TRANSMISSIBILITY OF SYPHILIS: THE INFECTIOUSNESS OF THE SEMINAL FLUID OF MEN WITH EARLY SYPHILIS. HARRY PARISER, J. Invest. Dermat. **5**:311 (Dec.) 1942.

Seminal fluid obtained from 20 men with early syphilis did not transmit syphilis to susceptible animals except when it was contaminated while passing over an open lesion containing the organisms (Spirochaeta pallida). It is postulated that the male, like the female, can transmit the disease only during the presence of open lesions containing S. pallida, whether chronologically early or late in the course of infection.

LECITHIN FEEDING IN THE SYNDROME OF PSORIASIS: II. CHEMICAL STUDIES OF THE RELATIONSHIP OF LECITHIN FEEDING TO FAT METABOLISM. CARL C. SMITH, LEON GOLDMAN and HARRY H. FOX, J. Invest. Dermat. **5**:321 (Dec.) 1942.

A study was started of the effect on the lipid levels of feeding a soybean lecithin mixture (lecithin 20 per cent, cephalin 20 per cent, oil 30 per cent, phytosterols 2 per cent, inositol and allied compounds 15 per cent and carbohydrates 10 per cent) to 5 patients with psoriasis of varying severity. These patients were observed in the hospital and were on a fat-poor diet at the same time. From the studies completed at present, in spite of improvement of the patients with lecithin feeding there was no decided change in the lipid levels and no definite changes in the abnormal lipid ratios. Three patients who had relatively low lipid levels improved with lecithin feeding, while 2 patients with relatively high lipid levels did not improve.

A NEW FORM OF LOCALIZED LIPOIDOSIS: GRANULOMA CHOLESTERINICUM SUBCUTANEUM. ERICH URBACH and BENJAMIN A. GOULEY, J. Invest. Dermat. **5**:331 (Dec.) 1942.

Cutaneous lipidoses can be divided on clinical and pathogenic grounds into generalized and localized types. The localized group is composed of a resorption type of xanthelasma, necrobiosis lipoidica diabeticorum, imbibitio lipoidica telae elasticae degeneratae cutis and imbibitio lipoidica collageni degenerati cutis. A new entity of localized lipoidosis is presented, "granuloma cholesterinicum subcutaneum." The distinguishing and characteristic feature is the presence of massive extracellular crystalline deposits of cholesterol esters and free cholesterol in cystlike cavities surrounded by granulomatous tissue of conspicuously lipid character. Those formations are situated solely in the subcutis, without any involvement of the overlying skin.

THE SIMILARITY OF THE FUNGI CAUSING SOUTH AMERICAN BLASTOMYCOSIS (PARACOCCIDIOIDAL GRANULOMA) AND NORTH AMERICAN BLASTOMYCOSIS (GILCHRIST'S DISEASE). N. F. CONANT and ARDEN HOWELL JR., J. Invest. Dermat. **5**:353 (Dec.) 1942.

A comparative study of eight cultures from patients with South American blastomycosis and seven cultures from patients with North American blastomycosis shows the causative fungi to be sufficiently similar to be placed in the same genus, namely, Blastomyces. Two species are recognized: Blastomyces brasiliensis, the etiologic agent of South American blastomycosis (paracoccidioidal granuloma), and Blastomyces dermatitidis, the etiologic agent of North American blastomycosis (Gilchrist's disease).

BACTERIAL FLORA OF NORMAL SKIN: A STUDY OF THE EFFECT OF SULFATHIAZOLE AND SOME OINTMENT BASES. DONALD M. PILLSBURY, BERTRAM SHAFFER and ANNA C. NICHOLS, J. Invest. Dermat. **5**:371 (Dec.) 1942.

Sulfathiazole in 5 per cent concentration in an emulsion base (sulfathiazole, 5 per cent; sodium lauryl sulfate, 1 per cent; stearyl alcohol, 10 per cent; cetyl alcohol, 3 per cent; spermaceti, 10 per cent; glycerin, 10 per cent, and water, 61 per cent) reduces the bacterial flora of the normal skin. Yellow petrolatum and hydrous wool fat have no apparent effect in modifying the rate at which bacteria are removed from the normal skin by a standard scrubbing technic. The emulsion base increases the rate of removal. This action is probably dependent on the ability of the emulsion base to soften the superficial epidermis, which

facilitates its removal by scrubbing. Qualitative studies fail to reveal a constant effect of any of these preparations in modifying the types of bacteria found in the normal skin.

THE EFFECT OF SULFONAMIDE DRUGS ON TRICHOPHYTONS IN VITRO. N. S. DIMOND and K. W. THOMPSON, J. Invest. Dermat. **5**:397 (Dec.) 1942.

In vitro tests of the action of sulfonamide compounds on Trichophyton purpureum and Trichophyton gypseum revealed no apparent fungicidal effect. Sulfanilamide was fungistatic in concentrations of 1:1000 or greater when the medium was free from "antisulfonamide" factors (peptone, paraaminobenzoic acid); on a peptone medium this drug in the same concentration induced an extension of the lag phase but did not retard the growth rate after the lag phase. The other sulfonamide compounds were ineffective in the concentrations used, even when tested on a peptone-free medium. There is a great need for highly effective fungicides that are suitable for the treatment of mycoses, as the sulfonamide compounds are for the treatment of certain bacterial infections.

THE EFFECTS OF CERTAIN VEHICLES AND OF SALT SOLUTIONS UPON REACTIVE HYPEREMIA IN THE SKIN: APPLICATION IN A CASE OF LICHEN RUBER PLANUS. IRVING L. MILBURG and JOSEPH R. DIPALMA, J. Invest. Dermat. **5**:403 (Dec.) 1942.

A method which permitted measurement of the vasodilatation response (reactive hyperemia) which resulted from a standardized period of local ischemia of the smallest dermal blood vessels in the skin was utilized to study the actions of hydrophilic substances and saline solutions on these fine blood vessels. The threshold, or stimulus, time of the "hyperemia skin test" was taken as an index of the sensitivity of the small dermal blood vessels, while the clearing time of the hyperemic response indicated the relative rate of blood flow in the skin. Fifty-eight subjects, 2 women and 56 men, were tested. Eighty-five determinations were made with the following substances: starch paste, 60 per cent solution of acacia, 30 per cent solution of sodium chloride and 30 per cent solution of magnesium sulfate. The effects of combination of these substances in equal volumes of an oxycholesterol-petrolatum ointment base (aquaphor) was also tested. Control studies consisted of a series of analogous experiments with distilled water, isotonic solution of sodium chloride and the oxycholesterol-petrolatum base.

The following conclusions were reached: Neither distilled water nor isotonic solution of sodium chloride significantly affected the threshold time or the clearing time of the hyperemia test. Starch paste and solution of acacia caused a decided increase in the sensitivity of the small dermal blood vessels. This was evidenced by a 26 per cent decrease in the threshold time and a 20 per cent decrease in the clearing time, the latter indicating a more rapid dermal blood flow. Hypertonic solution of sodium chloride did not alter the hyperemic cutaneous responses, while hypertonic solution of magnesium sulfate caused a moderate increase in the sensitivity of the small cutaneous blood vessels. The oxycholesterol-petrolatum base alone caused a moderate increase in sensitivity of the small dermal blood vessels (15.4 per cent). However, addition of an equal volume of starch, acacia, distilled water or isotonic or hypertonic solution of sodium chloride did not alter the capacity of this ointment base to enhance reactive hyperemia.

THE VIRULENCE OF STRAINS OF PHIALOPHORA VERRUCOSA DETERMINED BY INOCULATING CHORIO-ALLANTOIC MEMBRANES OF CHICK EMBRYOS. MORRIS MOORE, J. Invest. Dermat. **5**:411 (Dec.) 1942.

The use of the chorioallantoic membrane of the chick embryo for the determination of pathogenicity of micro-organisms is relatively recent. In the comparatively short time that this structure has been in use, it has proved beyond doubt that it is one of the most useful tools in the biologic investigations for which it has been adapted. The microscopic response of the tissue to the strains of phialaphora verrucosa varied in accordance with the virulence of the inoculum. This was made apparent with the fungus of low virulence by the foreign body type of reaction accompanied by a slow invasion of the membrane. The edema, inflammation and thickening of the ectoderm present a picture of superficial rather than deep involvement. The retention of the filamentous form of the fungus and the engulfing of these by macrophages with a foreign body response again bear out the low virulence. The 1938 strain of P. verrucosa, however, shows a picture microscopically which is compatible with virulence. This is manifested by the rapid invasion of the membrane by the fungus; by the formation of large nodules within the mesoderm; by the conversion of the fungus cells to the type characteristic of human lesions; by the lack of giant cells as a result of rapid invasion, and by the complete loss in character of the involved ectoderm, which shows a striking cellular response.

BLUEFARB, Chicago.

HERPES ZOSTER OTICUS TREATED WITH OMNADIN. F. U. MAGNUSSEN, Ztschr. f. Hals-, Nasen- u. Ohrenh. **47**:119 (Dec.) 1940.

Magnussen reported a case of herpes zoster oticus which was characterized by the usual syndrome of pain, herpes, deafness and paralysis of the face. The patient was given 2 cc. of omnadin (a sterile solution of protein substances obtained from nonpathogenic bacteria [Sarcina and Bacillus mycoides], various animal fats and lipoids derived from bile) intramuscularly on the first, second and fifth days after admission to the hospital. After the first injection she showed decided improvement in her facial paralysis, and on the fifth day after her admission hearing was spontaneously restored. There were no recurrences, and she was discharged, completely cured.

PERSKY, Philadelphia. [ARCH. OTOLARYNG.]

THE EFFECT OF SCHAUMANN'S DISEASE UPON THE HEART AND ITS MECHANISM. W. T. LONGCOPE and A. M. FISHER, Acta med. Scandinav. **108**:529, 1941.

In a series of 31 cases of sarcoidosis 6 patients showed some evidence of myocardial insufficiency during life or sarcoids of the heart and pericardium were discovered at autopsy. In 1 patient who showed no abnormalities of the heart during life a few lesions were found scattered through the myocardium at autopsy. The remaining 5 patients presented some evidence of the disease of the heart. Three of these patients died. Autopsies performed on 2 of them showed sarcoidosis of the myocardium and pericardium.

The 5 patients suffered from various degrees of heart failure, often with enlargement of the heart, arrhythmias and electrocardiographic changes.

KAJDI, Baltimore. [AM. J. DIS. CHILD.]

VENEREAL LYMPHOGRANULOMA IN CHILDREN. MOGENS WINGE, Nord. med. **9**:807 (March 15) 1941.

Winge reports the cases of 2 girls, 16 and 13 years of age, suffering from lymphogranuloma venereum, probably infected by their mothers. In both children there were stricture of the rectum and hydrops of the knee joints; in one of them, in addition, a left-sided coxitis. The latter girl died after rectal operation. The author presents a table of the hitherto published 20 cases of inguinal lymphogranuloma in children (18 patients being girls). Eleven of the patients suffered from rectal stricture, 9 from inguinal adenitis, 6 from arthritis and 2 from erythema nodosum.

PERIARTERITIS NODOSA. SIGNE BANKE, Ugesk. f. læger **103**:532 (April 24) 1941.

An 8 year old boy fell ill with signs of subacute polyarthritis, fever and eruptions of pea-sized reddish blue papules localized at the extensor side of the elbows and knees. Biopsy disclosed arteritis and periarteritis. Tests of the blood revealed an increased sedimentation rate and a negative Wassermann reaction. His reaction to tuberculin was negative. The urine, the blood and the heart and abdominal organs were not abnormal. The boy was kept under clinical observation for one year, and slight improvement was noted. New nodules appeared while the older ones gradually disappeared, leaving a colored spot such as is observed after a hematoma.

WALLGREN, Göteborg, Sweden. [AM. J. DIS. CHILD.]

Society Transactions

NEW YORK DERMATOLOGICAL SOCIETY

R. H. Rulison, M.D., *President*

A. Benson Cannon, M.D., *Secretary*

Jan. 26, 1943

A Case for Diagnosis (Arsenical Pigmentation and Hyperkeratosis?). Presented by Dr. George C. Andrews.

M. S., a woman aged 43, first noticed at the age of 15 brown spots on the sides of her neck and on her wrists. She had had no serious sickness except measles prior to that time. There was no history of taking arsenic or other medicines. She had typhoid at the age of 23.

Examination shows dark brown streaks and irregularly shaped patches of pigment in a collaret about the neck extending down over the chest. Some are of the shape of a raindrop. Similar pigment is located about the wrists and extends in a linear fashion up the extensor surfaces of both forearms to the elbows. The dorsa of the hands and the armpits are similarly profusely covered with pigmented spots. Similar pigment is also present in the gluteal folds and about the rectum and on the upper inner part of the thighs near the groins. The palms and soles are diffusely thickened and horny. There is no pigmentation in the mouth and no line on the gums. The conjunctivas are free from pigmentation.

The patient was seen first yesterday, and there has been no opportunity for laboratory examinations to be made.

DISCUSSION

Dr. Frank C. Combes: I agree with the diagnosis, but I am puzzled as to where the arsenic came from.

A Case for Diagnosis (Lichen Planus? Dermatitis Medicamentosa [Gold]? Peripheral Neuritis?). Presented by Dr. A. Benson Cannon.

R. H. S., a 61 year old American executive, consulted me today, complaining of symptoms beginning about March 1, 1942 with bluish red pea-sized to dime-sized raised tender lesions on the fronts and sides of his legs. His physician diagnosed the trouble as of rheumatic origin. All the lesions disappeared after he had taken pills for one week. About ten days later he noticed red scaly pea-sized lesions on the scalp, followed in about twenty-four hours by an intense redness and swelling of both ears. At the right nasal orifice was a red angry swelling thought to be a fever sore. His physician said that each lesion appeared different from the others and that he was unable to make a diagnosis. The patient was given sulfanilamide and arsenic. Three days later the same dermatologist made a positive diagnosis of lupus erythematosus. During the intervening three days the lesions had spread over the forehead, the sides of the face and the neck. He was then given injections of gold sodium thiosulfate and a preparation of bismuth intravenously, beginning with 0.1 mg. and increasing to 20 mg. He received five injections of each metal. Exposure to light, even daylight or lamplight, produced exceedingly severe itching, burning and tingling in the affected parts; therefore, use of the drugs was discontinued. By this time, the lesions had spread over most of the trunk, upper extremities, soles and palms and were papular, red, scaly and itchy. The physician then thought of lichen planus, and a specimen was removed from a lesion on the back of the right hand and sent to a dermatologist in Philadelphia, who returned a report of lichen planus with the remark that at first glance the histologic structure resembled that of lupus erythematosus but that a more detailed study convinced him that the specimen was from a lesion of lichen planus.

The patient became ill during the time he was taking injections of the gold salt. He collapsed in a faint, became extremely nervous and weak, suffered with insomnia and lost 15 pounds (6.8 Kg.) in weight. His temperature was between 102 and 103 F. He was confined to a hospital bed in a dark room for three weeks, during the first ten days of which his life was despaired of by the physician. Improvement from soothing applications, a high vitamin diet and supplementary vitamins by mouth and by injection was immediate and progressive, so that in a few months all cutaneous lesions disappeared with the exception of

those around the neck and on the soles and palms. Large bullae formed on the soles, and the entire epidermis peeled from the soles and palms on two different occasions three months apart. Several large blebs appeared on the soles at one time and superficial ulcerations on the palmar surface of the fingers, and during this acute illness there was ulceration of the entire mucous membrane of the mouth and throat.

Since November 1 the patient has received eight weekly treatments of roentgen irradiation to the lesion of the neck. He has been taking vitamins by mouth and applying boric acid ointment to the skin. The palms and soles have continued to be sore and painful. He is weak, has not regained his weight and feels nervous.

The patient's personal history and the family history are irrelevant.

Examination shows a fairly well developed and well nourished man who does not appear acutely ill. He has a coarse tremor in the upper extremities and tongue, most pronounced in the fingers. The general physical and the neurologic examination gave essentially normal results. The blood pressure was 130 systolic and 90 diastolic in each arm. On the trunk and on the upper extremities, most noticeable on the upper part of the trunk, are discrete palm-sized areas of deep brown to light brown pigmentation. In some pigmented areas there are atrophy and telangiectasis. On the back and sides of the neck, extending into the edge of the hair line and to the seventh cervical vertebra, is a plaquelike patch of deep red, thickened and scaly skin, the outer portions of which show discrete millet seed-sized to pea-sized lichenoid papules, some shiny and others scaly. There are linear papules and streaks, some ½ inch (1 cm.) long. There is some involvement of the skin behind the ears. The palms and soles are dark red, smooth and shiny and are covered with a tissue-paper-like epidermis. The feet and toes are deeply cyanosed. On the palmar surface of the right index and middle fingers are three scarred areas. The mucous membrane of the lips is dry and scaly, and there is a lacy annular white lesion along the entire borders of both lips. The mucous membranes of the tongue, cheek and throat are congested.

DISCUSSION

DR. GEORGE M. LEWIS: I think the essential diagnosis is lupus erythematosus complicated by photosensitization. I can see no evidence of lichen planus at present. Some mistake may have been made in the section, or perhaps therapy has caused a lichen-planus-like histologic structure in the skin.

DR. EUGENE F. TRAUB: I saw nothing tonight on which a hard and fast diagnosis of lichen planus can be based. The eruption on the neck, which was the only apparently active one, with the possible exception of some of the spots on the hand, was only slightly suggestive of lupus erythematosus. One must judge from the history and the eruption that the patient has a gold rash, and of course that can sometimes manifest itself in a lichen-planus-like eruption. If lichen planus was not diagnosed until the patient received the gold salt, it is most probable that he had a lichen-planus-like eruption following ingestion of gold. When did lichen planus come into the picture?

DR. A. BENSON CANNON: It was observed only recently.

DR. EUGENE F. TRAUB: A lichen-planus-like eruption following ingestion of a gold compound gives a histologic picture of lichen planus.

DR. FRED WISE: This eruption might be an instance of the diffuse erythematous rash which rarely precedes the papular form of lichen planus.

DR. MAX JESSNER (by invitation): I am of the same opinion as Dr. Traub. The patient has also received some arsenic, which, like gold, may produce a lichen-planus-like eruption. The lesions which the patient has on the neck are somewhat lichenoid, and he also has some lichenoid papules on the backs of the hands. The histologic picture of eruption due to use of gold or arsenic may be almost completely like that of lichen planus; therefore, if one just sees the slide without knowing the development of the case, a histologic diagnosis of lichen planus might be expected. I feel that this man's eruption may be interpreted as a lichen-planus-like eruption due to a drug.

DR. PAUL E. BECHET: It is interesting to note how frequently eruptions following the use of the heavy metals present a varied picture. A patient recently under my observation had typical lichen planus lesions in some areas and equally typical pityriasis rosea lesions on the trunk after aurotherapy.

DR. A. BENSON CANNON: I think it would be unusual for a patient to recover from discoid lupus erythematosus of the scalp, face and other parts without having any alopecia or scarring. Furthermore, the active lesion on the back and side of his neck has healed in places, leaving a brownish pigmentation. At the margin of the active lesion are numerous

millet seed–sized shiny lichenoid papules. In no place can I notice patulous follicles, hypertrophic scaling, telangiectasia or atrophy, symptoms necessary for the diagnosis of discoid lupus erythematosus. The atrophy and pigmentation of the trunk followed the gold dermatitis, as did the cyanosis of the feet.

NOTE.—The histologic report on the tissue removed from the back of the neck was interpreted by three pathologists as indicative of lichen planus.

Lupus Vulgaris Hypertrophicus. Presented by DR. HOWARD FOX.

Mrs. J. Di F., aged 49, born in Italy, was referred by Dr. Charles R. Mitchell. She came to the United States in 1910, and since then she has always lived in New Jersey, except for a brief period in Florida about two years ago. In 1914 she had two attacks of facial erysipelas followed by complete recovery. She gave no family or personal history of tuberculosis. Her husband had incipient tuberculosis of the lungs about fifteen years ago, which was completely arrested.

In January 1940 the patient first noticed a lump on the left eyebrow, which on histologic examination proved to be an epithelioma. It was successfully treated with roentgen irradiation. In October 1940 she had an extensive eruption of the face, neck, trunk and upper extremities, which was diagnosed as seborrheic dermatitis by a physician. The present type of eruption on the face began in May 1942, and during the past year it has spread rapidly.

Examination shows a fairly symmetric eruption of the face, including the lower part of the forehead, the nose and the cheeks and to a slight extent the upper lip. The eruption consists of large dull red elevated smooth nodules which have coalesced to form a diffuse area. Numerous glands of the lateral cervical and posterior occipital chains are enlarged, discrete, firm and tender. There are no symptoms or signs of leprosy. The Wassermann reaction of the blood was negative. Histologic examination by Dr. Wilbert Sachs showed typical lupus vulgaris.

Previous treatment consisted of thirteen injections of gold sodium thiosulfate and nine injections of a preparation of bismuth, from which no benefit was received.

DISCUSSION

DR. A. BENSON CANNON: I consider this an excellent example of lupus tumidus. I advocate treating the patient with generalized exposures to a carbon arc lamp, use of a high vitamin diet and liver extract and weekly injections of arsphenamine. I have seen such lesions of lupus disappear after a course of ten to fifteen weekly injections of arsphenamine.

DR. EUGENE F. TRAUB: The remarkable point is the fact that the eruption developed to such an extent in a year.

DR. FRED WISE: I suggest at least a trial of a 10 per cent pyrogallol ointment.

DR. MAX JESSNER (by invitation): Such widespread lupus vulgaris is difficult to treat. The last years before I left Breslau, the routine treatment of lupus vulgaris consisted of superficial removal of the lupus tissue with the diathermic loop, followed by a series of treatments with pyrogallol. The patients were sent home and then were reexamined after some months. Any remaining lupus tissue was treated in the same way or with a Finsen lamp. This procedure was repeated as often as necessary. It is important in a case like this to have the nasal mucosa examined by a rhinologist, because most or all patients with lupus vulgaris who have lesions around the nose have lupus of the nasal mucosa. It is of no avail to treat the lupus vulgaris of the skin without at the same time treating the nasal mucosa. I have never seen lupus vulgaris develop so rapidly as in this case. The patient shows tumid lesions, and if the treatment mentioned goes deep enough she will without doubt have a serious deformity of the face; but I see no alternative form of treatment. Regarding a salt-free diet, we tried it for some time for all the patients in the home for patients with lupus vulgaris attached to the clinic in Breslau. A selected number were treated with diet alone; most of the group received external treatment in addition to a salt-free diet. While I have never seen any patient treated only with diet get completely cured, diet does help, especially for the more exudative forms of lupus vulgaris.

DR. HOWARD FOX: I thought the case was of interest on account of the striking similarity to the lepromatous type of leprosy, a disease which can, however, be easily excluded. Against the diagnosis of syphilis were the negative serologic reaction and the symmetry of the eruption. Although the histologic structure was that of lupus vulgaris, I agree that this eruption has run an extremely rapid course. I thought it best to try the salt-free diet at first, instead of a destructive agent like pyrogallol. A number of years ago at the Charité Hospital in Berlin, Dr. Blumenthal showed me a ward full of patients with lupus vulgaris, all of whom

he had treated solely by a salt-free diet. Although none of them was cured by this method, a tremendous improvement was shown when their appearance was compared with photographs taken before treatment.

Neurotic Excoriations. Presented by DR. GEORGE M. LEWIS.

R. A., a 45 year old widow, is presented from the New York Hospital. She has had the desire to pick her skin from childhood. She admits traumatizing the skin with hairpins, needles and tweezers and freely admits that the urge to traumatize the skin is irresistible. The history of primary lesions is confused and contradictory. Pain is present at various times, and a throbbing sensation as well as formication is described. The eighth nerve on the left side was severed by a bullet some years ago; with time there has been a gradual improvement in muscular power. There is a history over many years of severe mental strain due to financial reverses. She has never had roentgen therapy.

At present there are two open areas on either side of the neck near the angles of the jaw. The cheeks, the chin and the forehead are badly scarred, with considerable loss of pigment and elasticity of the skin. The Wassermann reaction of the blood was negative.

DISCUSSION

DR. GEORGE M. LEWIS: The face is usually spared in such cases, but this woman has deliberately over a period of years traumatized the skin in many ways.

A Case for Diagnosis (Actinomycosis? Neurotic Excoriations?). Presented by DR. HOWARD FOX.

W. McM., captain of a tanker in the merchant marine, aged 42, of Scottish ancestry, was first seen by me on Jan. 4, 1943. In December 1938, he suffered from "pimples" of the bearded area which were diagnosed as folliculitis. They healed in a few months. About nine months later, a similar type of eruption appeared at the back of the neck, involving both hairy and glabrous areas. This eruption lasted about two years and left numerous scars. A lump on the chin appeared in July 1941, and lesions on the scalp were first noted a year ago.

Examination shows an oval mass on the point of the chin, the size of a horse chestnut. It is reddish, firm and nontender. At the lower point is a large open draining sinus admitting a probe for ¾ inch (2 cm.). Connected with the mass is a wavy linear scar running along the border of the chin for nearly 2 inches (5 cm.). There is a thin mucopurulent discharge which the patient says contains yellowish grains from time to time. Frequent microscopic examinations of the discharge failed to show any evidence of actinomycetes or other fungi. A culture yielded only Staphylococcus aureus.

The lesions on the back of the neck consist almost entirely of superficial white smooth scars of bizarre patterns. On the scalp, are three lesions varying in size from that of a pea to that of a five cent piece; they are mostly bald, partly crusted, red and excoriated. Both the scars on the neck and the lesions on the scalp suggest artefacts. The lesions of the chin, however, suggest actinomycosis.

The pharyngeal reflex was entirely absent; the corneal reflex was less active than normal. The patient's mentality seems normal. There was no improvement from use of potassium iodide in increasing doses at the end of one month and no improvement from two treatments with filtered roentgen rays (300 r each) to the lesion on the chin.

DISCUSSION

DR. A. BENSON CANNON: The patient has a hard tumor that is attached to the periosteum and moves only with the jaw. At the lower margin of the tumor is an indolent ulcerated area the size of the nail of the little finger with a hard verrucous red granular base, the whole giving the impression of a new growth. I believe that a biopsy is imperative in order to settle the diagnosis.

DR. GEORGE M. LEWIS: The lack of soft swellings with draining sinuses is a point against actinomycosis. The punched-out appearance suggests either a tumor or a factitial eruption. I suggest the desirability of a roentgenogram.

DR. GEORGE C. ANDREWS: The strange part of the history is that a similar lesion has apparently disappeared spontaneously from the left side of the jaw, which would be unusual if it was a tumor. Have any roentgenograms of the bone been made?

DR. HOWARD FOX: No.

DR. EUGENE F. TRAUB: Various considerations have been discussed which militate against a diagnosis of actinomycosis. To these can be added the peculiar linear scar underneath and

parallel with the angle of the jaw, apparently caused by spontaneous healing of the older scattered lesions, which I do not believe could be expected in actinomycosis. These features would certainly not be found with a malignant tumor; hence all the features of the case count against actinomycosis or epithelioma. There is a possibility that has not been mentioned thus far. I wonder if this man injures himself in attempting to remove infected hairs, not necessarily as a malingerer but innocently in an attempt to assist treatment. Patients not infrequently change the course of an eruption and mislead examiners because they do not tell of their manipulations while still not meaning really to deceive. This would explain the spontaneous healing and the multiplicity of lesions in this case.

DR. R. H. RULISON: Would it explain the hardness of the tumor?

DR. EUGENE F. TRAUB: Yes, it would.

DR. HOWARD FOX: I have thought of the possibility of some irritation caused by the patient himself. The lesions on the back of the neck in particular look artificial to me, and the lesions on the scalp could also be produced by some irritant or by an attempt to pull out the hairs. I am in doubt about the nature of the lesion on the chin.

DR. EUGENE F. TRAUB: A great deal could be decided by the use of an occlusive dressing, which I suggest should be tried.

Multiple Ulcers of the Skin; Chronic Ulcerative Colitis. Presented by DR. FRED WISE.

A. A., a woman aged 32, registered at the New York Skin and Cancer Hospital on Dec. 22, 1942, complaining of cutaneous ulcers of ten days' duration. She gave a history of having had ulcerative colitis for ten years. Similar ulcers appeared on various parts of her body two years ago and lasted about eight months, necessitating hospitalization, surgical intervention and therapy with a sulfonamide compound. She stated that these ulcers begin as deep painful "pimples," breaking down, as a rule, within a week to form ulcers. She has had excisions and skin grafts.

Three ulcers are located on the left breast, two on the left thigh, one on each buttock and one on the sacral region. They vary in size from 1.5 by 3 to 3 by 3 cm. They have irregular bases and granulating borders. One of the ulcers on the left thigh is located in the scar of a healed ulcer present two years previously. On the back and gluteal regions are several scars of healed lesions.

Bacteriologic studies of the ulcers revealed staphylococci (Staphylococcus aureus) but no anaerobic organisms. The stools did not contain ova, parasites or amebas. In the specimen examined were many leukocytes and a moderate number of erythrocytes. Vitamin A and C levels were normal. On gastroscopy the gastric mucosa was found to be normal.

The Wassermann, Frei and complement fixation tests for lymphogranuloma venereum gave negative results. A small ulcer was excised on Nov. 3, 1942, at the Harvard Medical School. The description is as follows: "The specimen consists of a circular fragment of epidermis and subcutaneous fat measuring 5 by 5 mm. in area and 2.5 cm. in thickness. On the skin surface is an irregular slightly undermined ulcerative lesion that is brown in color and extends down directly to the subcutaneous fat. There is little fibrosis beneath the lesion. On microscopic examination the epithelium was found ulcerated at numerous points and showed a few smooth clearly delimited downgrowths. The underlying tissue is composed of heavily infected granulation tissue made up of fibroblasts and many capillaries and heavily infiltrated with lymphocytes, macrophages, polymorphonuclear leukocytes and numerous foreign body giant cells. A few small abscesses are present."

The patient was treated with twenty tablets of sulfasuxidine (2-[p-succinylaminobenzene-sulfonamido]-thiazole), 0.5 Gm. each, two capsules of vitamin B complex, and 100 mg. of vitamin C a day. Locally she was treated with gramicidin ointment. On January 29 the patient felt much better. The bowel movements were reduced from ten to two a day, and the cutaneous lesions were healing rapidly. Subsequently the patient was under the care of Dr. Ben Kanee, who reported progressive improvement.

DISCUSSION

DR. FRANK C. COMBES: Of course ulcers like these appear with amebic dysentery, but I have never seen them with idiopathic colitis.

DR. A. BENSON CANNON: If one could rule out the possibility of self-inflicted wounds, the only other diagnosis that I would consider would be an anaerobic streptococcus infection, as described by Dr. Frank Meleney.

DR. EUGENE F. TRAUB: The unusual feature in this case is the fact that the lesions are high on the patient's body rather than confined to the legs.

DR. GEORGE C. ANDREWS: In Brunsting's patients the lesions were on the thighs and body, and the disease was not amebic dysentery but chronic ulcerative colitis.

DR. GEORGE M. LEWIS: Has amebic dysentery been completely ruled out?

DR. FRED WISE: We eliminated the possibility of self-produced lesions. Cutaneous ulcers are associated with the idiopathic form of colitis as well as with amebic dysentery. This appears to be idiopathic colitis with lesions on parts of the body where they are not usually encountered. One remedy which helped was gramicidin ointment; it cleared up the lesions quickly. The ulcers are most often situated on the legs of patients with idiopathic colitis.

Sarcoidosis. Presented by DR. A. BENSON CANNON.

B. H., a widowed Negress aged 53, is presented with an eruption on the nose, face, arms and fingers of twelve years' duration. The patient first entered Vanderbilt Clinic on June 9, 1931, with the statement that she had had a boil on the right nostril the previous winter and that the tip of her nose had been red and swollen for four months. She was born in New York city and had spent the greater part of her life here, but she had lived a few years in Puerto Rico. Her husband had died by accident. There was no history of tuberculosis in the family. At the time of her admission in 1931 the lesion was dark red, fairly well circumscribed and slightly indurated and involved the entire tip of the nose. The remainder of the physical examination gave essentially normal results except for the right epitrochlear node, which measured 1 cm. in diameter.

In June 1931, the Wassermann reaction of the blood was negative. Cutaneous tests with old tuberculin (1:10,000) and avian tuberculin (1:1,000) gave negative reactions. The biopsy showed lupus pernio, possibly sarcoid. In July 1931, the nasal smear did not contain acid-fast organisms. In December 1931, roentgenograms of the hands and feet showed atrophy of the terminal phalanges, as commonly seen in scleroderma. On March 16, 1932, the Wassermann reaction of the blood was negative; on May 4, it was 2 plus. On June 29, the reaction was negative with alcoholic antigen and 3 plus with cholesterol antigen. Tests with old tuberculin (1:1,000) gave negative reactions in December 1932. From January to July 1933, the patient received five exposures of high voltage roentgen rays (300 r) filtered through 1 mm. of aluminum, without improvement. On Jan. 11, 1934, it was noted that the axillary nodes were enlarged, more on the left than on the right side. The posterior and anterior cervical nodes were enlarged, and some were matted together. On February 6, there were nodular swellings of the fingers and of the backs of the hands and several nodules measuring 1 cm. in diameter on the upper part of the arms. There were crusted lesions on both elbows and large reddish cutaneous nodules on the left forearm. The diagnosis of miliary lupoid (sarcoid) was made on the basis of a repeat biopsy of the lesion on the arm. In March the urine showed faint traces of albumin.

In September 1935, there were swellings of the soft tissues of some of the fingers. There was some diminished density of several bones of the phalanges. In March 1936, a clinical fibroma was removed from the perianal region, and the disease was diagnosed histologically as tuberculosis of the anal region. In September 1936, the Wassermann reaction of the blood was negative with alcoholic antigen and 2 plus with cholesterol antigen. In January 1938, roentgenograms were made of the hands, feet and chest and were reported as follows: The findings were consistent with sarcoid by infiltration along the inner zone of the lungs; the lesions on the fingers and toes were probably due to sarcoid. At the same time chemical studies of the blood showed the following values: serum phosphatase activity, 2 Bodansky units; inorganic phosphorus, 3.1 mg. per hundred cubic centimeters; calcium, 10.4 mg.; non-protein nitrogen, 21 mg.; protein, 9.2 per cent; albumin, 4.2 per cent; globulin, 5.0 per cent and euglobin, 1.7 per cent. In February 1938 it was noted that she had gained 18 pounds (8.2 Kg.) in weight.

On Jan. 20, 1942, a nasal smear did not yield acid-fast organisms. Roentgenograms of the fingers and toes and of the chest showed peribronchial fibrosis and bronchiectasis at the bases of both lungs. There was no actual destruction of bone, but general demineralization with changes in the nutrient foramen of the phalanges was evident. The changes in the lungs and in the bones were both suggestive of sarcoid.

Treatment consisted of injections of triphal (0.025 Gm. intravenously), eight in three months, from Dec. 23, 1931 to Jan. 23, 1932. Beginning in February 1934, she received 3 drops of solution of potassium arsenite three times daily. From Feb. 27, 1935, she received 0.2 Gm. of quinine bismuth iodide weekly for forty treatments, up to June 3, 1936. In October 1936, treatments started with intramuscular injections of liver extract. She received twenty-five injections up to Jan. 20, 1943.

DISCUSSION

DR. FRED WISE: The diagnosis of leprous sarcoid deserves consideration.

DR. HOWARD FOX: I am sorry to disagree with Dr. Wise, but I do not think this case is one of leprosy. I assume he considered it a case of neural leprosy, in which sarcoid (or tuberculoid) structure may be present. The mere fact that the woman came from the British West Indies does not necessarily prove the diagnosis. As far as leprosy is concerned, there were no clinical changes in the fingers, interosseous muscles or bones, and I undertand there were no sensory changes. There was no enlargement of the great auricular nerves, and the ulnar nerves were apparently not enlarged. I think it is an extensive and unusual sarcoidosis. The roentgen changes in the bones that Dr. Cannon spoke of would fit in with the diagnosis of sarcoid. If this were the sarcoid (tuberculoid) type of leprosy, one would not find lepra bacilli in the lesions.

DR. FRANK C. COMBES: I agree with Dr. Fox. Three differential points that should be considered are the inverted albumin/globulin ratio in sarcoidosis, the eosinophilia and the high serum calcium level.

DR. A. BENSON CANNON: Twelve Wassermann examinations of this patient's blood have been made at intervals in the last several years, with results varying from 4 plus to negative. She has had no antisyphilitic therapy. When I first saw her, I was struck by the similarity of her lesions to those found in leprosy, and the suspicion of leprosy was somewhat confirmed in my opinion by her having been born in the British West Indies. She has been thoroughly studied for leprosy by means of roentgenograms of the bones, biopsies and smears, and while we have not been able to rule out that disease, most of the observers have considered the diagnosis to be sarcoidosis.

DR. GEORGE C. ANDREWS: Will Dr. Wise tell us why he thought it might be leprosy?

DR. FRED WISE: I got that impression from the color of the lesions, their consistency and their location; I thought the ulnar nerve was definitely thickened. The general appearance is that of leprosy or of sarcoid due to leprosy.

Xanthoma Tuberosum Multiplex. Presented by DR. EUGENE F. TRAUB.

C. L., a woman aged 66, is presented from the New York Skin and Cancer Hospital, complaining of an eruption of two years' duration, involving the extensor surfaces of the forearms and the elbows, dorsa of the hands, knees, backs of the thighs and buttocks. She had an operation on the gallbladder twenty years before.

On the extensor surfaces of the forearms are numerous flattened tumors, violaceous red with a faint yellowish tinge, and of various sizes up to a diameter of 1 cm. The surface of the lesions is smooth, and they are not raised more than 1 cm. above the surface of the skin. On the elbows there are larger tumors, with a diameter of 2 cm., and of a much more irregular shape. On the dorsa of the hands the lesions are flat and resemble granuloma annulare in some respects. There are many small papular lesions on the knees, on the backs of the thighs and on the buttocks. Just below the knees is an area of lesions that suggest lichen planus.

The urine was normal on several occasions. The blood contained 310 mg. of cholesterol and 90 mg. of dextrose per hundred cubic centimeters. The content of total lipids was 968 mg. per hundred cubic centimeters; of fatty acids, 579 mg.; of lipid phosphorus, 9.2 mg. and of cholesterol, 385 mg.

Histologic examination of tissue removed from the knee showed the corium to be filled with nodules consisting of round pale-staining cells and occasional multinucleated cells. Many of the blood vessels had thick walls. In the nodules some of the cells showed a yellowish stain indicative of fat. Histologic examination of tissue removed from the hand showed acanthotic epidermis. In the upper part of the corium were islands and strands of large pale-staining cells. The outlines of the collagen fibers were blurred. At one end of the section was found the peculiar strandlike degeneration of the collagen fibers which is associated with the center of granuloma annulare. The section stained positively for fat. Histologic examination of tissue removed from the elbow showed strands and nodules of large pale-staining cells and numerous round cells, lymphocytes, polymorphonuclear leukocytes and fragmented cells.

DISCUSSION

DR. FRED WISE: Many of the smaller lesions closely simulate lichen planus.

DR. FRANK C. COMBES: Except for the color of the lesions, I think this is typical xanthoma tuberosum. As for lichen planus, the changes extend too deep into the tissues.

DR. A. BENSON CANNON: It is an unusual picture for xanthoma tuberosum, but the results of the histologic study cannot be disputed.

DR. HOWARD FOX: I do not think I ever saw xanthoma that looked like this. If the histologic picture rules out lichen planus, the diagnosis of Dr. Traub will have to be accepted.

DR. EUGENE F. TRAUB: Since a number of men who first saw this patient thought of lichen planus, we took specimens for biopsy from four different areas. Because of lesions that appeared to me to be almost of the iris type and their location in sites common to erythema multiforme, together with the relatively short duration of some of the lesions, some of them appearing while others were disappearing, I thought that she might have had an erythema multiforme. As the patient also had some tumor-like lesions on the elbow, I do not think one could escape the diagnosis of xanthoma. My thought was that in a patient with this type of xanthoma, erythema multiforme, assuming that she had this, might have given rise to further xanthomatous tumors. We examined the sections with all these diagnoses in mind, and the report on each was xanthoma. The blood picture was that of high cholesteremia, with a content between 360 and 400 mg. per hundred cubic centimeters, and the total lipids were 968 mg.; I think that is a definite picture of xanthoma.

Diabetes; Hypertensive Cardiovascular Disease; Psoriasis; Scleredema (?). Presented by DR. A. BENSON CANNON.

H. E., a man aged 57, married, a Polish Jew, first noticed a red scaly eruption over the interscapular and scapular areas about twenty years ago. This has since gradually spread down the back to the sacrum, with clearing in the original areas. It has spread to involve the chest, abdomen, scalp, extensor surfaces of both arms and legs, knees and elbows. The patient says the eruption never itches unless he perspires. Exposure to sun clears the lesions temporarily. During the past year he has applied iodine to the lesions, with clearing of some of them. He has none on the scalp now.

About nine months ago a private physician discovered a thick boardlike induration over the scapular area, extending to the lumbar area, about 1 foot (30 cm.) square. The patient was not aware of this condition except that he had noticed that at times his back felt tight when he stretched his arms. He has no idea when this thickened plaque developed. He says he has had diabetes for twenty years.

The red scaly sharply demarcated lesions over the sacrum, the trunk anteriorly, the right elbow and both knees and the left shin are slightly elevated and thickened. The scales in some of these lesions are micaceous and silvery; in others, they are almost granular and adherent. On the back, from the shoulders on both sides to the lumbar area, is a solid indurated rubbery mass, with a rather sharply demarcated edge. It covers an area of about 1 square foot (930 square centimeters). The skin over this area appears to have been the site of a previous dermatosis. The area has a violaceous color and does not pit on pressure. It is painless. At the lower margin it gradually merges into the psoriatic eruption over the sacrum.

The patient's weight is 173 pounds (78.5 Kg.). The basal metabolic rate was —5 per cent. The Kline reaction was negative. Urinalysis showed albumin (2 plus), dextrose (2 plus) and occasional leukocytes on microscopic examination. The sugar content of the blood varied from 121 to 138 mg. per hundred cubic centimeters. The serum contained 6.8 per cent protein, 4.6 per cent albumin and 2.2 per cent globulin and 37 mg. of nonprotein nitrogen, 194 mg. of cholesterol and 4.6 mg. of uric acid per hundred cubic centimeters. The blood count showed a hemoglobin content of 94 per cent (13.6 Gm.), 4,830,000 erythrocytes and 7,700 leukocytes, with a differential count of 59 per cent polymorphonuclear leukocytes, 33 per cent lymphocytes, 1 per cent monocytes, 6 per cent eosinophils and 1 per cent basophils. The erythrocyte sedimentation rate was 15 mm. in one hour.

DISCUSSION

DR. FRED WISE: Dr. Jessner called my attention to the development of scleredema following an acute infection, such as influenza. The thickening of the tissues begins on the back of the neck and progresses downward rather rapidly, sometimes involving the entire back.

DR. MAX JESSNER (by invitation): In all cases so-called Buschke's scleredema seems to start after some infectious disease, especially grip. Most of the lesions begin on the back of the neck. Some stop on the shoulder region, while others spread farther, healing spontaneously. As Dr. Wise said, this feels and looks absolutely like the form of scleredema described by Buschke.

DR. HOWARD FOX: I should like to call attention to the letter in the ARCHIVES (ARCH. DERMAT. & SYPH. **47**:110-111 [Jan.] 1943) by Major Saffron. In looking over a copy of

the textbook written by the late Henry G. Piffard, he found a perfect description of scleredema, which had been written thirty years before the publication of Buschke.

Pemphigus; Diabetes. Presented by DR. EUGENE F. TRAUB.

S. R., a 60 year old Jew, born in Russia, came to the New York Skin and Cancer Hospital on Jan. 4, 1943, with a generalized slightly grouped eruption of two months' duration.

The patient presents large bullae on the inner side of the lower part of the right thigh on normal skin. There are crusted lesions on the legs, the left side of the chest and the arms; all were preceded by bullae. There are several bullous crusted lesions on the right arm. There are no lesions in the mouth or in the axillas. Mild pruritus is present. The general health of the patient seems to be good. There is no history obtainable of the use of internal medication. The patient is diabetic, and the disease is controlled by diet.

Histologic examination showed "subepidermic vesicles." A patch test with potassium iodide in petrolatum (30 per cent) gave a negative reaction, the petrolatum control patch producing the same minimum of redness as the potassium iodide ointment. The blood sugar level was reported as 80 mg. per hundred cubic centimeters. The complete blood count showed 5,590,000 erythrocytes and a hemoglobin content of 97 per cent; 5,650 leukocytes; 53 per cent polymorphonuclear leukocytes, 2 per cent eosinophils, 3 per cent monocytes, 41 per cent lymphocytes and 1 per cent band forms. The Nikolsky sign was positive.

DISCUSSION

DR. FRED WISE: A toxic bullous eruption or an erythema-multiforme–like eruption should be given consideration in the differential diagnosis.

DR. HOWARD FOX: I agree with Dr. Wise. One cannot make a categoric diagnosis of pemphigus at present, although one may suspect that disease.

Melanoma. Presented by DR. JEROME KINGSBURY.

H. H., a man aged 56, born in Russia, gives a history that about ten years ago solid carbon dioxide was used for the removal of a pigmented nevus from the right side of his back. It was said at the time that a good result was believed to have been obtained. About three months ago a sore developed at the site of the original lesion. This gradually increased in size, and occasionally there was slight bleeding. There is now an elevated, deeply pigmented tumor about ½ inch (1.3 cm.) in diameter at the right side of the back.

DISCUSSION

DR. EUGENE F. TRAUB: I do not believe there can be any question about the diagnosis at present, and the one thing to consider is what to do now. I would suggest, first, an extensive roentgen examination to determine if metastases are present. If none are found, the patient should be given the benefit of an extensive local removal, preferably with the electric cutting current. It all harks back to the fact that one cannot tell anything about pigmented lesions. The patient gave a history of a smooth, flat, nonhairy, brown, so-called junction type nevus, the precursor of a malignant type of melanoma, which is now black and obviously active. If that history is correct and the lesion was treated with solid carbon dioxide when it was already active, it may be too late to do much good by removing it now.

DR. HOWARD FOX: There is no cosmetic reason to make one hesitate about removing it. There is plenty of loose tissue in that location.

Tuberculid of the Face (Rosacea-Like). Presented by DR. EUGENE F. TRAUB.

D. F., a man aged 28, came to the New York Skin and Cancer Hospital on Jan. 13, 1943, with an eruption on the face of approximately four months' duration. The patient had had pleurisy at the age of 12 years. Before the present eruption appeared, he felt "run down" because of overwork. His mother had pulmonary tuberculosis, and one brother had tuberculosis of the spine.

The patient shows a superficial macular and papular reddish eruption on the forehead and sides of the face. Diascopic pressure reveals numerous small sharply defined "apple jelly" spots.

The histologic examination was reported by Dr. Barthel as indicating "some form of tuberculosis." The reaction to tuberculin (1:5,000) was negative (observed for ten days), and with a dilution of 1:1,000 it was positive.

DISCUSSION

DR. PAUL E. BECHET: If the patient showed more erythema and the lesions were confined to the rosacea area, the condition probably could not have escaped the diagnosis of Lewan-

dowsky's rosacea-like tuberculid. I have always contended that this diagnosis is frequently made for typical acne rosacea, that its name is unfortunate and that the term "rosacea-like" should not be used. In my opinion, Lewandowsky's rosacea-like tuberculid is invariably a tuberculoid or tuberculous process which bears no clinical resemblance whatsoever to rosacea.

DR. GEORGE C. ANDREWS: Did not MacKee and Sulzberger separate the two conditions, lupus miliaris faciei and Lewandowsky's rosacea-like tuberculid, according to the tuberculin reaction? I believe they said the reaction was strong in a patient with the latter disease and less so in one with the former. That proved to be a fallacy. This patient shows the same distribution of the lesions that MacKee described, i. e., on the cheeks, near the mouth but away from the nose. I have a patient with the same condition, with a weak tuberculin reaction, like this man's, and with little response to any method of treatment. It seems to me that since time has shown that many patients with this type of disease have weak tuberculin reactions the two conditions cannot be separated as readily as MacKee and Sulzberger believed.

DR. EUGENE F. TRAUB: I put the diagnosis down as tuberculid of the face, but I am frank to say I think we are arguing and quibbling about names. The picture in this case does not resemble rosacea at all, and the only reason for calling it by that name is that so many cases have been reported that way in the literature. When I presented a number of cases of tuberculosis miliaris faciei they were put in the same category by several authors. There ought to be some agreement about the terminology. I have a slide here, and it showed clearcut tubercle structure. If one gave that slide to a histologist, he would say that it indicated lupus vulgaris.

RAY H. RULISON, M.D., *President*

A. BENSON CANNON, M.D., *Secretary*

Feb. 23, 1943

Sporotrichosis. Presented by DR. RAY H. RULISON.

E. U., a man aged 68, was first seen on Feb. 18, 1943. He has been employed as a gardener in Woodlawn Cemetery, in the Bronx, New York, for twenty-two years.

On Sept. 14, 1942, the end of his right thumb was punctured by a thorn. He says he is not sure whether it was a thorn from a rosebush or from a barberry. A day or so later he cut the tip of his right thumb just under the nail with a knife while cleaning myrtle. Within a few days swelling and inflammation of the thumb developed. He consulted a physician, who cared for him for about one month. During this time nodules developed on the back of the hand and up the forearm and there were considerable swelling and discomfort in the affected limb.

On October 11 he came under the care of another Westchester County physician, who has since cared for him. This physician has made a number of small incisions in the skin of the forearm to drain pus, and local applications of solutions of sodium hypochlorite and zinc oxide ointment have been used. The patient continued at work until Jan. 28, 1943, when he stopped because of the condition of his hand and forearm.

Smears and cultures were made on February 18 by Miss Hopper, of the New York Hospital, and the patient was also seen by Dr. George M. Lewis. Color photographs of this eruption were taken by Miss Hopper, but they have not yet been printed.

The smears showed few bacteria and no blastomycetes. The cultures on the morning of February 23 showed a typical, dark-colored growth of sporothrix. One of these is almost a pure culture.

A clinical diagnosis of sporotrichosis was made.

DISCUSSION

DR. GEORGE M. MACKEE: The clinical conditions in this case are typical of sporotrichosis, and the four day culture is also typical.

DR. FRED WISE: If I recall correctly, this is the seventh or eighth case to be reported from the state of New York.

DR. GEORGE M. LEWIS: This strain of Sporotrichum produces an unusual amount of pigment in the medium, as shown in the five day culture. It is of interest that there is a tendency to spontaneous cure, apparently with little treatment except simple incision. In most cases the disease responds rapidly to therapy with potassium iodide. One of the lesions now present

looks fairly characteristic; the remainder are suggestive because of their distribution along the lymphatics of the arm, but otherwise they would impress me more as pyogenic lesions.

DR. RAY H. RULISON: The case interested me because of the history the patient volunteered that the thorn causing the original trauma was from either a rosebush or a barberry bush. I called Dr. Gleason, head of the Bronx Botanical Gardens, and asked him about barbery and whether it was poisonous, because Dr. H. E. Michelson, of Minneapolis, listed a series of 18 cases of sporotrichosis in 14 of which the infection had begun with injury from a barberry thorn. Dr. Gleason said that so far as he knows there is nothing poisonous about the shrub, but it has thin, sharply pointed thorns which can cause a deep puncture wound. I also talked to Dr. Kenneth Taylor, who did a good deal of work on sporotrichosis, and he said that barberry hedges were popular in Minnesota and that the preferred fertilizer for barberry was horse manure. The relation of sporotrichosis to horses has been commented on; hence I was rather impressed that this man said of his own accord that the injury had been caused by either a barberry or a rose thorn.

A Case for Diagnosis (Lepra?). Presented by DR. FRED WISE.

C. H., a 48 year old Chinese waiter referred by Dr. John H. Harris, was first seen in January 1943, at which time he presented an eruption consisting of violaceous and brownish papules and small nodules limited to the face, with a few nodules in the hairy portion of the temporal region. He stated that he had had this eruption for two years and had received numerous injections of a bismuth preparation, without improvement.

The urine was normal. The hemoglobin content of the blood was 80 per cent, and the erythrocytes numbered 4,400,000 per cubic millimeter. The leukocyte count was within normal limits. The Wassermann reaction of the blood was negative. A nasal smear did not reveal acid-fast bacilli.

Microscopic examination on two separate occasions did not reveal anything definite. It showed a chronic inflammatory reaction with a plasma cell infiltration. Special stains for acid-fast bacilli were made, but such organisms were not found. A definite histologic diagnosis could not be made.

DISCUSSION

DR. HOWARD FOX: The tendency in a case like this is to suspect leprosy because of the patient's race. I do not think the lesions on the face are lepromas. It is true that the right ulnar nerve seems somewhat thicker than the left, although there is no loss of sensation on pressure. Enlargement of the ulnar nerves is usually a dubious sign unless the increase in size is great. In view of the failure to find acid-fast bacilli in the nasal mucosa and because there are no sensory abnormalities and the patient has always lived in the United States, I think there is little ground on which a diagnosis of leprosy can be made. Furthermore, the histologic examination of the cutaneous lesions showed no evidence of leprosy. It is true that a number of cases of leprosy in American-born Chinese in California are on record, although none has been reported in recent years.

DR. EUGENE F. TRAUB: I did not see this patient tonight, but I have seen him at the clinic. He scratches a great deal, and many of the lesions are excoriated. Many Chinese patients apparently have itchy skins, with little if any eruption to account for it until a neurodermatitis or excoriations are produced. I believe that something of the sort occurred in this man. I wonder if the plasma cell infiltration seen in the sections may not be incidental to a general condition, such as syphilis, while the lesions on the face are simply mechanically produced by scratching.

Dermatitis in Tattooed Areas. Presented by DR. RAY H. RULISON.

G. LaV., a sheet metal worker aged 48, acquired an occupational dermatitis on Dec. 14, 1942. The first areas involved were the fingers, palms and backs of the hands. A day or so later a similar eruption developed in the anogenital region, and after about one week the tattooed areas on the forearms and the right arm showed a somewhat raised and crusted itchy dermatitis in the red pigmented areas only.

The Wassermann reaction of the blood was negative on Jan. 5, 1943. Urinalysis and blood counts gave values within normal limits.

A patch test with a liquid soap used in the plant in which the patient was employed gave a 1 plus reaction.

With soothing treatment the eruption, aside from that in the tattooed areas, which showed little change, cleared up. The patient was discharged on January 15, with the expectation that the tattoo eruption would gradually subside. He was referred back on February 23 for

further treatment. There has been no recurrence of the eruption previously treated, but the eruption in the tattooed area remains much as it was when the patient was first seen and is rather itchy.

The patient is presented for opinion as to the explanation of this eruption and the reason for its persistence and for suggestions for treatment.

DISCUSSION

DR. HOWARD FOX: Have any tests been made for sensitization to mercury?

DR. GEORGE M. MACKEE: It is possible that the patient has acquired sensitivity to mercury. A patch test with cinnabar close to the present area of eruption is indicated.

DR. GEORGE M. LEWIS: If the tests show sensitivity to mercury, the only cure possible is excision of the tattooed areas. The clinical feature in favor of a reaction to cinnabar is the irregularity of the lesions. One area is triangular.

DR. FRANK C. COMBES: Tests for sensitivity to mercury by a patch test and by internal administration should certainly be made. This eruption is likely to last a long time. I have a patient now who had an American flag tattooed into the skin, and the dermatitis involves each red stripe. The patient did not respond to roentgen therapy, and he has had the dermatitis for a year and a half. I think Dr. Lewis is right in suggesting that the lesion be punched out.

DR. EUGENE F. TRAUB: I did not see the patient, but from what Dr. Combes said I suggest that he could have the lesion removed in a simple way. A surgeon who removed a mean-looking tattoo for me just used a razor such as is used for doing a Thiersch graft, and the end result was excellent.

DR. GEORGE M. MACKEE: The eruption may have been coincidental, but it is not unusual for a patient who has become sensitized to one substance to become sensitized to something else; it may have been an occupational dermatitis in the beginning.

DR. RAY H. RULISON: This man was referred from an airplane plant where there is a first aid service; the attendants there like to use 10 per cent ammoniated mercury ointment, and some may have been given to him before I saw him. If so, that may have something to do with the eruption.

Sickle Cell Anemia with Ulcerations. Presented by DR. EUGENE F. TRAUB.

T. R., a Negress aged 20, born in the United States, is presented with an ulcer of the leg of five years' duration. The patient stated that at the age of 8 she had a superficial "fester" on the right arm which terminated in osteomyelitis. A similar lesion also developed on the forearm at about the same site and left a peculiar scar. At the age of 15 she burned her leg with hot grease and an ulcer developed that has failed to heal. The patient thinks she scratched a mosquito bite on the left leg, which also terminated in an ulcer.

The Wassermann reaction of the blood was negative. The blood count showed a hemoglobin content of 60 per cent, 3,610,000 red blood cells, with sickling, and 23,100 white blood cells, with 73 per cent neutrophils, 2 per cent eosinophils, 24 per cent lymphocytes and 1 per cent monocytes. The urine was normal, with no albumin or sugar.

There is no history of tuberculosis in the family.

DISCUSSION

DR. HOWARD FOX: Sickle cell anemia is a disease that is almost entirely confined to the Negro race or at least to persons with some Negro blood. A most interesting discussion of this subject is given at length in the recent volume by Julian H. Lewis on "The Biology of the Negro," published in 1942 by the University of Chicago Press, Chicago. According to the author, who cited various authorities, there is no effective treatment for the disease.

DR. GEORGE C. ANDREWS: Blood counts should be made for other members of the family.

DR. FRED WISE: Is iron prescribed for patients with this disease?

DR. EUGENE F. TRAUB: I wonder whether any one thinks that the osteomyelitis, which apparently began as a surface infection of the skin and extended inward, may be associated with the sickle cell anemia.

Urticaria Pigmentosa in an Adult. Presented by DR. FRED WISE.

F. R., a woman aged 54, a native of Poland, registered at the New York Skin and Cancer Hospital on Aug. 27, 1940, presenting generalized lesions of four years' duration. She complained of itching.

The entire torso is studded with barleycorn-sized to split pea–sized macules and slightly elevated papules. The latter are nonscaly, soft and well defined. The color of the lesions varies. Some are pink; some are yellow, and others are red. They exhibit varying stages of development in the same regions of the body. At times there are concomitant eruptions of hives. Rubbing of the papules produces elevation and a well developed red color of the papules. The routine laboratory tests gave normal results.

Experimental treatment with sixteen injections of bismuth subsalicylate in oil of 1 cc. each (0.1 Gm. of metallic bismuth per cubic centimeter) has not changed the appearance of the eruption. Superficial generalized exposures to roentgen rays have been ordered experimentally to ascertain the response. A calamine and zinc oxide lotion containing 0.25 per cent menthol was prescribed for local application.

Paget's Disease of the Vulva. Presented by DR. EUGENE F. TRAUB.

Z. F., a woman aged 66, was first seen at the New York Skin and Cancer Hospital with an eruption of the vulva which was preceded by vaginitis and discharge. Scrapings taken from the area on culture yielded Monilia. The eruption was treated on this basis, without clearing up entirely, however, and gradually the more invasive and verrucous character of the eruption became apparent. The patient is presented particularly for therapeutic suggestions.

Biopsy showed that the epidermis was acanthotic and covered with a parakeratotic scale, which was moderately thinned. Scattered throughout the epidermis were islands of large swollen cells, the cytoplasm of which showed a granular degeneration and a nevoid deposition. These cells had hyperpigmented nuclei. The nests also appeared in the parakeratotic scale. The corium was edematous and showed decided toxic change, with dilated blood vessels and a round cell exudate. There were numerous hyalinized cells with solid pigmented nuclei. On the basis of the microscopic examination a diagnosis of Paget's disease of the vulva was made.

DISCUSSION

DR. FRANK C. COMBES: I see no reason why there should not be a concept of so-called Paget's disease, or superficial epitheliomatosis of the Paget type, outside of the mammary gland.

DR. GEORGE M. LEWIS: I agree with Dr. Combes that the appearance of the lesions and the histologic changes are those of Paget's disease.

DR. WOLFGANG A. CASPER (by invitation): In the biopsy sections histologic changes are found, in some places almost limited to the basal cell layer, the only abnormality being the presence of the "Paget" cells. However, some sweat glands and sweat ducts show the same type of Paget cells, but nowhere is there a reactive infiltration surrounding them. I do not doubt that there exists an extramammary Paget's disease of the skin, and that this condition must be grouped among the so-called "precancerous dermatoses." According to the literature, this is the fifth or sixth case reported.

DR. FRED WISE: I agree with Dr. Combe's remarks.

DR. GEORGE M. MACKEE: It seems to me to have been established that there is such a thing as extramammary Paget's disease, and this woman's eruption looks like Paget's disease both clinically and histologically. Clinically, there is a sharp margin and little exudation, and the eruption is progressive. It looks exactly like Paget's disease as seen around the nipple and areola. Histologically, I saw four perfect Paget's cells in one field. I think differentiation has to be made from other varieties of dyskeratosis, such as erythroplasia, Hailey's pemphigus and Bowen's disease, but I agree with the diagnosis of extramammary Paget's disease.

DR. HOWARD FOX: The recent edition of the text by Ormsby and Montgomery indicates that extramammary Paget's disease is exceedingly rare. In many supposed cases of this disease, the correct diagnosis has been found to be Bowen's disease, superficial epitheliomatosis or some other dyskeratotic eruption. Before this case is recorded as one of extramammary Paget's disease, I think the histologic slides should be submitted to a number of the best general pathologists.

DR. GEORGE C. ANDREWS: In connection with this cutaneous lesion, a careful examination should be made to determine the condition of the vagina and cervix. There may be an extension of the growth to those locations, or the lesion of the skin may be an extension of an internal growth.

DR. EUGENE F. TRAUB: I believe that originally the patient had a vaginitis with mild discharge, and subsequently, when these red, oozing lesions developed, a microscopic examination was made and Monilia was found. Then, with drying up of the acute eczematous eruption,

this more characteristic cancerous dermatosis became apparent. Dr. Casper was responsible for the early diagnosis in this case.

DR. WOLFGANG A. CASPER (by invitation): It might be interesting to note that monilias were isolated on culture and that this was one of the reasons that the patient was referred to us with the diagnosis of a deep mycosis. The eruption looked flat on one side of the mons veneris, while the other side showed a condyloma-like growth. In answer to Dr. Fox's question as to whether this may be an epithelioma, I shall be glad to submit the slides to any pathologist he suggests.

Dyskeratosis Congenita with Pigmentation, Dystrophia Unguis and Leukokeratosis Oris (Cole and Others). Presented by DR. FRED WISE.

J. W., a man aged 25, referred by Dr. Gdali Rubin, registered at the New York Skin and Cancer Hospital on Jan. 28, 1943, presenting lesions of nineteen years' duration. He stated that his brother aged 20 has similar depigmented and hyperpigmented spots on the neck only, but of a lighter color. His parents and another brother and sister are said to be free from cutaneous disease.

The patient had measles and scarlet fever. At the age of 5 years he had infantile paralysis, which affected especially his left arm. He complains that after a regular day's work he feels extremely tired. He sweats profusely. For about a year he has been constipated and has been taking liquid petrolatum. He was told by ophthalmologists that he has closed tear ducts. He has lost 11 pounds (5 Kg.) during the past two weeks. He is now 5 feet 8 inches (170 cm.) in height and weighs 114 pounds (51.8 Kg.).

The lesions appeared first on the front and sides of the neck. A year later similar lesions appeared on the face and three years later, on the trunk and legs. The lesions in the mouth appeared about two years ago. In the summer many more white spots appear on the neck and face, and the pigmented areas become more darkly colored. None of the spots has ever disappeared.

The patient has hyperpigmented areas on the face, neck, upper and lower limbs and trunk, but not in the bathing trunk area. The depigmented patches are found mostly on the neck and less profusely on the arms. They vary in size from that of a match head to that of a large bean. The hyperpigmented areas form a fine network. The skin of the neck feels velvety to touch. The hands are cyanotic. All the nail plates except that of the right middle finger are mostly destroyed, and the remnants are thinned, dystrophic and ridged in linear formation. Similar changes are noted in the toe nails. The entire left side of the mouth and the lower lip are covered with leukoplakic areas. All the teeth have been extracted from the lower jaw, and the nine remaining in the upper jaw are yellow and in poor condition. The gums are pyorrheic and bleed easily on the slightest pressure. The hearing is normal. He has many ulcerations on the right lower extremity. The right testis is larger than the left, the right being the size of a pecan and the left of a hazelnut.

The urine was normal. The hemogram showed 3,480,000 red blood cells and 8 monocytes per cubic millimeter. Studies of the vitamin A content gave normal results.

A section of the hyperpigmented skin examined histologically was interpreted by Dr. Charles F. Sims as "consistent with the diagnosis of poikiloderma." The epidermis was rather thin. In the basal layer was a moderate amount of brownish pigment. There was a moderate dilatation of the follicular orifices, which were filled with a more or less compact horny plug. The vessels of the upper part of the corium were moderately dilated, and there was an exceedingly sparse cellular infiltration composed of an occasional small round cell, wandering connective tissue cells and chromatophores containing pigment granules. In the subpapillary zone there was an interstitial and parenchymatous edema of the collagen. A thionine stain revealed no mucin.

The patient is being treated with five tablets a day of thiamine hydrochloride, of 5 mg. each.

The clinical appearance of this patient is almost identical with that of the patient described by Cole and his collaborators (ARCH. DERMAT. & SYPH. **21**:71 [Jan.] 1930).

DISCUSSION

DR. GEORGE C. ANDREWS: This is a remarkable case and quite different from the type of pachyonychia congenita described by Jadassohn, in which the nails are greatly thickened and horny papules are found over the elbows, knees and buttocks, resembling Darier's disease. This is apparently a congenital defect of the skin.

DR. EUGENE F. TRAUB: I should like to suggest to Dr. Wise that he get the family tree to publish with the case, because apparently the brother has the disease and perhaps other members of the family may be affected.

DR. GEORGE M. MACKEE: I think this is a case of typical dyskeratosis congenita. The entire syndrome is present. The unusual feature here is the reticulated pigmentation, which looks like Civatte's poikiloderma.

DR. HOWARD FOX: The whole picture is that of an unusual congenital anomaly apparently like that of the patient of Cole and not like that reported by Jadassohn and Lewandowsky or like that of the 2 patients I showed before dermatologic societies (ARCH. DERMAT. & SYPH. **18**:794 [Nov.] 1928; **39**:367 [Feb.] 1939). In my cases, as the name would imply, the patients had tremendously thickened nails, while this man has atrophy of the nails at present. He also does not have warty lesions suggesting Darier's disease, as my patients had, but he does have leukoplakic patches in the mouth.

Lichen Planus? Moniliasis? Tinea Versicolor? Presented by DR. A. BENSON CANNON.

A. R., a man aged 27, single, of Italian extraction, is presented with an eruption which has been present in the mouth for nine or ten years and on the arms and trunk for three or four years. The patches on the tongue and mucous membranes of the mouth and lips have gradually increased and become thickened at the corners of the mouth. Spicy or hot foods cause pain and soreness. The patient says that his physician prescribed vitamin B_1 and nicotinic acid, which relieved the local irritation but has not changed the appearance of the white areas. The patient also noticed a slightly itchy and burning brownish slightly scaly condition on the trunk for three to four years. Personal and family histories are irrelevant.

Examination reveals on the trunk, arms and groins patchy and confluent macular finely scaly tan to brown areas. Tinea versicolor was found in the scales removed from these patches. Examination also reveals a white lacy patchy condition of the mucous membranes on the inner aspects of the lips and on the mucous membrane of the cheeks, hard palate and tongue. This strikingly resembles the lesions of lichen planus. At the corners of the mouth and on the adjacent portions of the mucous membrane of the cheeks, the whitened lesions are thick and formed into projectile, filiform verrucous lesions unlike those one would expect with lichen planus. A section of tissue removed from these warty lesions showed a hypertrophic mucous membrane with chronic inflammation. No evidence of lichen planus could be found. Numerous hyphae were seen in the sections. Cultures showed Monilia albicans. The Wassermann reaction of the blood was negative.

DISCUSSION

DR. EUGENE F. TRAUB: I should certainly not believe that the eruption in the mouth was lichen planus. I think it is some other disease—perhaps a monilia infection.

DR. GEORGE M. LEWIS: I believe the proper diagnosis is thrush of the adult type. The lesions are inflammatory, and the surface can be rubbed off. The infiltrated hypertrophic areas are seen in that disease in the adult. I believe that the finding of Monilia, particularly if in large amounts, is confirmatory.

DR. WOLFGANG A. CASPER (by invitation): The hyperkeratosis on an inflammatory base at the soft palate seems to me an interesting feature. Lichen planus seems the most likely diagnosis.

DR. FRED WISE: I agree with Dr. Lewis that it is probably a monilia infection and not lichen planus. The man has a so-called scrotal tongue, with deeply indented fissures, which is especially susceptible to fungous infection.

DR. GEORGE M. MACKEE: This man may have moniliasis or even lichen planus, but I think the case should be investigated further because leukoplakia may be present. Immediately inside of the left commissure there is a dime-sized white patch that seemed infiltrated. If this is a patch of infiltrated leukoplakia, it is potentially dangerous. I suggest a biopsy and a mycologic examination.

DR. HOWARD FOX: Some of these lesions certainly resemble leukoplakia, though I saw tiny cleancut lesions on the buccal mucosa suggesting lichen planus. The fact that the patient has had this disease for nine years would not rule out lichen planus confined to the tongue. A patient of mine had lesions confined to the mouth for eight years (ARCH. DERMAT. & SYPH. **24**:1071 [Dec.] 1931). I am inclined to think this is lichen planus.

DR. GEORGE M. LEWIS: In a case of a similar, although not so extensive, eruption, which proved to be moniliasis of the buccal mucosa, the patient did well with compound solution of iodine U. S. P. (Lugol's solution) used as a mouth wash.

Angiomas of the Head. Presented by DR. EUGENE F. TRAUB.

L. Y., a man aged 55, came to the New York Skin and Cancer Hospital on Jan. 25, 1943, with lesions stated to be of six years' duration. These were found on the back of the scalp,

on the left cheek (several) and at the right angle of the mouth. The lesions were elevated reddish masses, varying in size from that of a pea to that of a small hazelnut. Blood could be expressed from the lesions on pressure, leaving what appeared to be a fibrotic nodule. A punch biopsy of the nevus at the right angle of the mouth confirmed the diagnosis of angioma. The section showed a growth of new blood vessels, many of which were dilated.

The rest of the lesions were treated lightly with electrodesiccation.

DISCUSSION

DR. HOWARD FOX: I believe these lesions are unquestionably fibroangiomas. If the lesions were pure hemangiomas, they would be a good deal redder and softer.

DR. GEORGE M. MACKEE: I examined the section microscopically, and the lesion is an angioma, but it seems to me that the collagen is extremely dense—much denser than normal—which makes the diagnosis fibroangioma.

DR. EUGENE F. TRAUB: These lesions did not seem to me to be like ordinary angiomas, but the patient was presented with the microscopic diagnosis made by our pathologist, Dr. Else A. Barthel. On palpation the masses feel nodular when the blood is expressed. I do not believe that it is an everyday occurrence to find so many such lesions scattered over the scalp and on the face of a patient over 50, although one occasionally sees isolated lesions of this character.

Further Report of a Case Presented at the Previous Meeting.

DR. HOWARD FOX: W. McM., a man aged 42, presented scars of the neck which were obviously artificial and lesions of the scalp which were probably of the same type (A Case for Diagnosis [Actinomycosis? Neurotic Excoriations?], this issue, p. 550). To prove the nature of the mass on the chin, he was treated by occlusive dressings, as suggested by Dr. Traub, and at the end of a month the sinus had closed completely and the mass had decreased to one fourth of its original size. The lesion of the scalp also cleared with occlusive dressings. It was therefore obvious that the entire process was due to the picking and scratching the lesions with his finger nails.

MANHATTAN DERMATOLOGIC SOCIETY

FRED WISE, M.D., *President*

ANTHONY C. CIPOLLARO, M.D., *Secretary*

Feb. 9, 1943

Pemphigus-Vulgaris-Like Eruption Following Use of Sulfonamide Compounds. Presented by DR. DAVID BLOOM.

R. P., an American Jewish nurse aged 47, has been under my care for the past five and a half months with a generalized bullous eruption associated with pruritus which has frequently been severe. Her history revealed hysterectomy six years ago and recurrent furunculosis during the past several years.

On July 22, 1942 the patient applied a 10 per cent sulfathiazole ointment to one of the furuncles on her thigh. Several days later she noticed pea-sized bullae on her left upper eyelid, on and inside the nose and in her mouth. On August 3 a carbuncle on the back of her neck was incised by a surgeon, who, according to her statement, inserted some powder into the wound. The bullae which were flaccid or broken were diagnosed as impetigo and treated successfully with ammoniated mercury ointment. On August 17 the patient was operated on at Sydenham Hospital for an incisional hernia of the abdomen, and at the end of the operation sulfanilamide powder was inserted into the wound before the skin was closed.

The patient was recuperating from the operation satisfactorily until August 29, when she applied a 10 per cent sulfathiazole ointment to a sore on the mucous membrane of the nose. One day later a few bullae were noticed on the back of her neck, and soon afterward the skin around the left eye became edematous and presented a few pea-sized bullae, which soon broke and resembled pyodermic lesions. A 5 per cent sulfathiazole ointment was prescribed but its use was soon discontinued because new bullae developed, not only on the eyelids and the face but on the mucous membranes of the mouth, on the abdomen, particularly along the incisional scar, and around the anus. Since then crops of bullae have developed frequently on the face and trunk, in the axillas and groins, around the anus, and on the vulva, upper and lower extremities, scalp and mouth.

During her stay in the hospital, to Dec. 12, 1942, her temperature varied between normal and 101 F. Her weakened general condition improved after numerous transfusions, injections of sodium arsenate, ingestion of liver extract and calcium gluconate and autohemotherapy. However, she is still confined to her home because of the presence of bullae on her soles and feet which make walking difficult.

She now presents broken or flaccid bullae on the palms and soles, on the legs and on the dorsa of the feet, on the elbows, in the axillas and in the groin. There are numerous excoriated and crusted lesions on the face, ears, scalp, tongue and inner aspect of the lips. The trunk presents many erythematous and superficially scarred macules—the sites of previous bullae. These macules contain numerous milia.

The blood count on numerous occasions revealed moderate diminution in the number of erythrocytes and in the hemoglobin content, while the leukocyte and differential counts were essentially normal. Examination of the urine showed normal conditions except for an increased urobilinogen content on one occasion. Chemical examination of the blood showed normal amounts of cholesterol, cholesterol esters, sugar, nonprotein nitrogen and sodium chloride. The icterus index was 6.1. A few days after the appearance of the generalized eruption the serum of the blood showed a trace of sulfanilamide, but none was found in the serum of the bullae.

A few days ago a patch test was made on apparently normal skin of the back with a saturated solution of sulfanilamide. Twenty-four hours later no reaction was noted. A patch test was then made with a saturated solution of sulfathiazole and a 5 per cent sulfathiazole ointment. There was no local reaction to the patch tests. About twelve hours after the application of the sulfathiazole a generalized pruritus developed and was followed several hours later by eruption of many bullae, particularly on the legs.

The phytopharmacologic test was reported by Dr. Macht as giving nontoxic results, i. e., the results were the same as with normal blood serum; the phytotoxic index was 71 per cent.

DISCUSSION

DR. ISADORE ROSEN: I saw this patient through the kindness of Dr. Bloom last summer, and it was difficult to make a diagnosis at that time between bullous erythema multiforme and pemphigus. Of course, the history of the ingestion and local application of one of the sulfonamide compounds had to be taken into consideration as a possible cause. I am inclined to the diagnosis of bullous erythema multiforme caused by sulfanilamide.

DR. M. JESSNER (by invitation): A drug eruption can imitate any disease of the skin, and my experience with the sulfonamide compounds is limited. Clinically, if I had not known that the patient had had an exacerbation after having been given sulfonamide compounds, I should have thought of dermatitis herpetiformis or pemphigus, and I still believe it would be useful to perform patch tests with an iodide and a bromide. If she does not react, I think one has to accept this as an unusual form of drug eruption due to sulfonamide compounds.

DR. E. WILLIAM ABRAMOWITZ: I saw this patient through Dr. Bloom at Sydenham Hospital, and the question arose as to whether she had pemphigus or some other bullous eruption. What was the connection between the eruption and the taking of the sulfonamide compound? I am inclined to think that she has pemphigus because of the numerous bullous lesions on the trunk and in the mouth and her poor general condition; these have remained long after use of the drug was discontinued. The recent recurrence after the local application of sulfathiazole may be considered only as a sign of sensitivity to the drug. There are a number of reported cases in which the topical application of the drug sensitized the patient. I am convinced that there is no difference in the mechanism of a drug eruption whether sensitization is initiated internally or externally. I suggested to Dr. Bloom that in view of the fact that paraaminobenzoic acid is known to inhibit the action of the sulfonamide compounds the patient might benefit by its use if some of the sulfathiazole is still present in the abdominal scar.

DR. M. B. PAROUNAGIAN: I agree with the clinical diagnosis of pemphigus.

DR. JACK WOLF: I favor the diagnosis of erythema multiforme bullosum. Paraaminobenzoic acid inactivates the sulfonamide compounds. It does not have any effect on the drug itself, but it prevents its bactericidal action.

DR. MAX SCHEER: I saw this patient for the first time tonight, but I have known about her since last summer, because the surgeon who operated on her gave me the details of her eruption and asked me for an opinion based on his description. I suggested the possibility of pemphigus at that time. Having seen the patient tonight, I feel she has pemphigus. I was

going to try the Nikolsky test, but she asked me not to do so because, she remarked, her healthy skin would rub off if I did it. I should like to ask Dr. Bloom if he has tried the Nikolsky test on this patient.

DR. GEORGE LEWIS: I have no strong opinion on the subject, but these lesions seem atypical for pemphigus. I think the disease is a toxic bullous dermatosis of some type.

DR. FRED WISE: Epidermal cysts sometimes constitute a prominent part of the eruption of pemphigus vulgaris. Such an example was demonstrated by Ormsby, of Chicago, several years ago. In his patient large areas of the skin were studded with innumerable milia-like cysts. As to Duhring's disease, it is advisable to test the patient with the test ointment of 10 per cent potassium iodide, which should be free of undissolved particles and thoroughly rubbed up. A well prepared ointment, as pointed out by Dr. Jessner, is of great value in testing the skin of patients with bullous and vesicular eruptions when Duhring's disease comes under consideration.

DR. DAVID BLOOM: The Nikolsky sign was positive. In one area where a patch test was made the epidermis came off with the adhesive plaster in spite of great care in removing it.

Milia may be seen not only in pemphigus vulgaris but in many other diseases, such as epidermolysis bullosa, dermatitis herpetiformis and other bullous dermatoses.

From a mere inspection of the eruption and the long duration of the illness one may be justified in making a diagnosis of pemphigus vulgaris. The development of bullae following application of sulfathiazole to the furuncles and to the mucous membrane of the nose and the generalized eruption of bullae, which were particularly numerous along the area of the incision scar into which sulfanilamide powder was inserted, suggest strongly that the eruption has been caused by the sulfonamide compounds. As I conceive it, the drugs have caused damage to the skin which is perhaps irreversible.

A Case for Diagnosis (Myoma?). Presented by DR. JACK WOLF.

L. F., a man aged 69, consulted me on Jan. 23, 1943 because of an eruption on the scalp which he thought was of approximately eight weeks' duration. The history as to duration is unreliable, since in response to further questioning after the examination he stated that he thought some manifestations were present as long as two years ago. The eruption was not accompanied with pain or itching. Eight years ago a lesion clinically diagnosed and histologically substantiated as xanthoma was removed from the outer aspect of the left leg.

On examination he presented a somewhat larger than silver dollar–sized bald atrophic smooth violaceous area with numerous telangiectases in the right frontoparietal region, extending almost to the hair line. On palpation of this smooth and shiny surface, the underlying tissues were found to consist of small irregular hard nodules bound down to the periosteum. These knobby lesions extended beyond the visibly affected zone and were also present under normal-appearing scalp covered with thick hair. No diagnosis beyond the possibility of basal cell epithelioma could be made at that time.

A piece of tissue was removed for histologic examination. The microscopic picture proved to be unusual, and the section was studied by several pathologists, including Dr. Richter, Dr. Jessner and Dr. Sims. The following description is by Dr. Charles Sims: The tissue presents numerous ill defined irregular areas separated by bundles of fibrous tissue. The ill defined areas consist of cells of varying sizes and shapes, with nuclei which are round or oval and which are decidedly hyperchromatic. At some points, groups or clusters of nuclei may be noted. The cytoplasm, which is eosinophilic, is ill defined. With Van Gieson stain these areas stain yellowish brown. The conditions are suggestive of a muscle tumor.

DISCUSSION

DR. WILBERT SACHS: I could not make a definite diagnosis from a casual examination of the slide tonight. One cannot discern anything clearly with the high power of this microscope, but with the low power I could see some nerve elements and a rather large number of blood vessels. I think one would have to make differential stains in order to rule out the several different types of neoplasms and arrive at a proper diagnosis. I suggest continued study of this slide with differential stains to determine if the growth is a myoma and, if so, of what type it is.

DR. M. JESSNER: The slides are difficult to interpret, especially because there is no epidermis or surrounding tissue. I think that without further stains and without biopsy of another specimen, including the covering epidermis and normal skin, it is impossible to make a diagnosis. I have never before seen such a slide.

DR. E. WILLIAM ABRAMOWITZ: The patient had a xanthoma removed at one time. There were shadows in some of the bones reported on roentgen examination. Schüller-Christian disease may be a possibility.

DR. GEORGE C. ANDREWS: I agree with the diagnosis of myoma.

DR. DAVID BLOOM: I believe that leiomyoma may be excluded, for it is associated with tenderness, which is absent in this case.

DR. FRED WISE: I have not encountered any patients with myoma of the skin whose lesions were as hard and firm as those of this patient.

DR. JACK WOLF: I did not think that the changes in the epidermis were remarkable; I accepted them as changes secondary to the extensive and severe underlying process. I naturally thought of the possibility of xanthoma, since I had occasion to remove the xanthomatous lesion from the leg eight years ago. The diagnosis of xanthoma was, however, ruled out by the histologic examination. In presenting this patient with the possible diagnosis of myoma I am influenced by the opinions expressed by the several pathologists, since a diagnosis on purely clinical grounds is not possible.

A Case for Diagnosis (Folliculitis?). Presented by DR. E. WILLIAM ABRAMOWITZ.

Mrs. J. K., a white woman aged 26, consulted me on Oct. 28, 1941. Her history is irrelevant except that since a severe sunburn about six or seven years ago she has been sensitive to sunlight. She had no cutaneous diseases until October 1941; then while working as a power press operator she started to clean her machine with a trichloroethylene fat solvent. About three weeks later an eruption developed on the back of her elbows; it spread to her knees and later appeared on her face and the back of her hands.

The eruption in these areas consisted of slightly elevated red papular and scaly lesions which remained almost stationary or left superficial atrophic pits. The lesions failed to respond to various treatments such as roentgen and ultraviolet irradiation and topical applications of sulfathiazole ointment, ammoniated mercury ointment and triple dye. She also received injections of liver extract, bismuth subsalicylate and calcium. At present she is receiving vitamin B complex in the form of Fleischmann's yeast, type 20-40, and a multiple vitamin preparation.

A specimen taken for biopsy on Oct. 30, 1942 from a lesion on the right elbow was reported on as follows: "The microscopic picture does not fit in with any clinical entity but rather with early stages of a mild dermatitis. The swollen lower epidermic cells suggest the possibility of dermatitis medicamentosa."

The blood count was essentially normal, as was the urine. The Wassermann reaction was negative. Intradermal tests made on Sept. 18, 1942 with tuberculin in dilutions of 1:10,000, 1:100,000 and 1:1,000,000 elicited negative responses.

The patient stopped working on Nov. 19, 1941 and then resumed work on Nov. 24, 1942 as a coil winder; she does not handle any irritating material. A physical examination by her physician last year showed no sign of any involvement of the heart or lungs.

DISCUSSION

DR. ANTHONY C. CIPOLLARO: Dr. Scheer demonstrated micaceous scales. I think the disease is psoriasis.

DR. GEORGE M. LEWIS: The lesions on the face have a superficial resemblance to lupus erythematosus. However, I do not think the lesions on the external surface of the arms and on the knees are those of this disease. It seems to me that psoriasis has to be seriously considered.

DR. GEORGE C. ANDREWS: I agree with the diagnosis of psoriasis.

DR. WILBERT SACHS: We could not arrive at a pathologic diagnosis. A cursory glance at the slide would convince one that there is no evidence of psoriasis here at all. What the patient has I do not know, but I do not think it is psoriasis. The microscopic examination suggests dermatitis medicamentosa.

DR. ISADORE ROSEN: I think the patient has an unusual superficial form of psoriasis, and for that reason I believe that either the skin that was removed was insufficiently sectioned or there was not enough to show the pathologic changes. However, I think that the pathologic changes would be atypical because the clinical picture is unusual. Frequently when psoriasis involves the face without lesions elsewhere it is difficult to differentiate it from lupus erythematosus.

DR. M. JESSNER (by invitation): Clinically, I thought the lesions were atypical psoriasis, but I agree with Dr. Sachs that in the slide there is nothing to suggest psoriasis. There is hyperkeratosis but no parakeratosis, and there should be some parakeratosis in psoriasis.

DR. M. B. PAROUNAGIAN: Clinical manifestations suggest to me some type of tuberculid rather than psoriasis. I noticed some depressed lesions on the extensor surface of the elbows which led me to that diagnosis.

DR. MAX SCHEER: At first I thought of papulonecrotic tuberculid, but the lesion I picked out as a tuberculid was the one from which the biopsy specimen was removed and that accounted for that depressed scar. In the other lesions I found no depressed scars. I am in favor of a diagnosis of psoriasis.

DR. E. WILLIAM ABRAMOWITZ: I have never seen any typical psoriasis lesions on this patient. The disease started as a follicular eruption covered with a scale or crust that left fine atrophic pits in the few lesions that healed. Sometimes I thought of a factitious eruption, but the woman says that she does not pick her skin. If it is psoriasis, the biopsy fails to confirm it. The biopsy likewise does not indicate papulonecrotic tuberculid or lupus erythematosus. This eruption appeared after the patient had handled trichloroethylene and bore a close resemblance to another eruption due to the same cause. In the latter instance also the lesions disappeared slowly, lasting four months.

Idiopathic Hemorrhagic Sarcoma and Lymphatic Leukemia. Presented by DR. ISADORE ROSEN.

J. K., a man aged 59, born in Austria, came to the New York Skin and Cancer Hospital on Jan. 11, 1943 with an eruption on the left sole, instep and inner aspect of the heel of seven months' duration.

In the right cervical and supraclavicular region there are greatly enlarged glands which are partly matted together. There are also enlarged glands, from the size of a hazelnut to that of a walnut, in the groins and axillas. On the left sole, instep and inner aspect of the heel, there are irregularly shaped violaceous indurated plaques of different sizes—from the size of a pea to that of a half-dollar. There are several lesions on the dorsum of the foot and toes. The patient states that after roentgen treatment to the right cervical region the glands increased in size.

Biopsy of a specimen from a lesion the size of a small pea on the sole was reported as indicating a "Kaposi sarcoma with infiltration suggesting leukemia." A complete blood count revealed the following values: erythrocytes, 3,640,000; hemoglobin content, 76 per cent, and leukocytes, 13,600, with 8 per cent neutrophils and 89 per cent lymphocytes. The clot retraction time was slightly retarded, and the fragility was normal. Approximately 10 per cent of the cells were immature. Smudge forms were discerned. The disease was diagnosed by Dr. Pascher as lymphatic leukemia.

DISCUSSION

DR. E. WILLIAM ABRAMOWITZ: I do not recall encountering this combination of conditions in the same patient. It is unusual and perhaps coincidental.

DR. WILBERT SACHS: I believe this is a most unusual slide because there are two types of lesions in the same section.

DR. DAVID BLOOM: The lesion on the sole, which is clinically typical of Kaposi's sarcoma, shows under the microscope also the pathologic features of leukemia. The question arises whether it is a mere coincidence or an indication of etiologic relation of these two entities. After roentgen therapy to the right cervical region, the lymph nodes have increased in size.

DR. JACK WOLF: In the past I have seen Kaposi's sarcoma in 1 patient with leukemia and in another with Hodgkins' disease. The case presented tonight is unique in that Kaposi's sarcoma and leukemia were observed in the same histologic section. The cases I refer to did not show such a histologic combination.

Basal Cell Epithelioma. Presented by DR. ANTHONY C. CIPOLLARO.

M. B., a woman aged 61, is presented from the New York Skin and Cancer Hospital. She had an ulcerated lesion about the size of a silver dollar in the right parietal area. There was crusting, and the border was infiltrated. The biopsy confirmed the diagnosis of basal cell epithelioma.

Treatment with roentgen irradiation was instituted. She was given 600 r of unfiltered low voltage (100 kilovolts) roentgen rays to the entire lesion twice a week for a total of eight

treatments. The total dose received was 4,800 r. This amount of irradiation produced a superficial acute radioepithelitis which disappeared in two or three weeks. There is now no evidence of the epithelioma or of the radiodermatitis, although the hair from this area is completely lost.

An unusually large dose of roentgen rays was given to this patient because basal cell epitheliomas of the scalp are notoriously resistant to all forms of irradiation.

Seborrheic Keratosis with Epithelioma. Presented by DR. ANTHONY C. CIPOLLARO.

N. B., a woman aged 60, presented from the New York Skin and Cancer Hospital, had on the tip of the nose a small crusted lesion which had been growing for several months. There was a brown adherent scale with a barely visible infiltrated border. Biopsy showed seborrheic keratosis and basosquamous cell epithelioma.

Treatment with roentgen irradiation was instituted. She received 600 r of unfiltered low voltage (100 kilovolts) rays once a week for five weeks. A total dose of 3,000 r was administered. The last treatment was given on Jan. 25, 1943. She now presents only a slightly depressed scar. There is no clinical evidence of epithelioma.

Infiltrating Basal Cell Epithelioma. Presented by DR. ANTHONY C. CIPOLLARO.

G. M., a woman aged 31, is presented from the New York Skin and Cancer Hospital. She had a lesion on the left side of the bridge of the nose close to the inner canthus which she stated had been present for four months. It was ulcerated and had a definite pearly border. A portion removed for biopsy showed an infiltrating basal cell epithelioma.

The lesion was closely shielded, and a dose of 300 r of unfiltered low voltage (100 kilovolts) roentgen rays was given twice a week for four weeks. The lesion was small; the clinical improvement was unsatisfactory, and there was little evidence of reaction to the irradiation. Therefore, one week later a dose of 600 r was given, and the same dose was repeated the following week. Over a period of six weeks, a total dose of 3,600 r was administered. There is now no clinical evidence of epithelioma. The cosmetic result is satisfactory.

Cutaneous Horn with Prickle Cell Epithelioma. Presented by DR. ANTHONY C. CIPOLLARO.

E. R., a woman aged 42, is presented from the New York Skin and Cancer Hospital. She presented on the dorsum of the right hand a keratotic lesion which measured about 1 cm. in circumference. It had been present approximately four months. The lesion was brown and hard, and the clinical diagnosis was cutaneous horn. The base of the lesion showed some infiltration.

The biopsy revealed the lesion to be a senile keratosis with beginning prickle cell epithelioma. The entire lesion was excised. After histologic study, the patient received postoperative irradiation.

A dose of 300 r of unfiltered low voltage (100 kilovolts) roentgen rays was given twice a week for three weeks. A total dose of 1,800 r was administered. This amount of radiation is generally considered to be too little for the treatment of malignant growths. There is no clinical evidence of epithelioma. The combined surgical and irradiation method is probably better than either method used alone in the treatment of prickle cell epithelioma of the skin.

Incidentally, the patient now presents a lesion on the right breast which she noticed several weeks ago. It appears to be a keratosis with beginning epithelioma.

DISCUSSION OF DR. CIPOLLARO'S CASES

DR. GEORGE ANDREWS: Two years ago I read a paper before the New York State Medical Society in which I described this divided dose technic. We use it routinely at the Vanderbilt Clinic. With 60 kilovolts and a 2 mm. aluminum filter we give 6,000 to 8,000 r. Of course some patients do not get quite that amount, but that is pretty much the routine dosage. The size of the field influences the size of the dose a little. I think the consensus now is that one obtains better results with daily treatment for eight days than with treatments given twice a week.

DR. GEORGE M. LEWIS: At the New York Hospital we have been using 2,000 to 3,000 r for epitheliomas, and the results seem to be satisfactory. I think Dr. Cipollaro's results are extremely good.

DR. M. B. PAROUNAGIAN: The results obtained in these cases are good, and Dr. Cipollaro should be congratulated for his splendid work.

DR. E. WILLIAM ABRAMOWITZ: The results are excellent. I want to congratulate Dr. Cipollaro. The question comes up whether this treatment is justified in all cases. For instance, is it justified in treatment of a small lesion that could be excised and cured in one week? With larger lesions, what is gained in time, expense, comfort and ultimate cure as compared with other methods?

DR. WILBERT SACHS: I think the results are excellent, but I should like to make a suggestion about one of the lesions. Seborrheic keratosis with intraepidermal mixed cell epithelioma is a benign lesion, and I feel that such treatment is far too heroic for general use.

DR. ANTHONY C. CIPOLLARO: My object in presenting these patients was not to demonstrate that roentgen irradiation constitutes the only method of treating cancer of the skin but to show that it is an effective method and that most types of cancer occurring in the skin respond to irradiation. The technic of treatment is simple and can be carried out by most dermatologists with low voltage apparatus. The administration of 300 r of unfiltered rays twice a week over a period of four weeks is sufficient for the usual varieties of cutaneous cancer. A total dose of 2,400 r is sufficient for most epitheliomas. I think that 6,000 to 8,000 r is unnecessarily high, especially if the total dose is administered in one week. In three series of cases I could find no differences in therapeutic response with varying voltages. One series was treated with filtered (2 mm. of aluminum) low voltage (52 kilovolts) rays; a second series, with unfiltered low voltage (100 kilovolts) rays, and a third series, with filtered (3 mm. of aluminum) medium voltage (137 kilovolts) rays. The average total dose was between 2,400 and 3,600 r given over a period of three to five weeks.

CLEVELAND DERMATOLOGICAL SOCIETY

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J. R. DRIVER, M.D., *Reporter*

Feb. 25, 1943

Localized Scleroderma. Presented by DR. W. R. HUBLER.

A. E., a white woman aged 68, presented from the department of dermatology and syphilology, University Hospitals, has had a small white area with a slight red flare in the umbilicus and another over the right tibia for nine years. For three years numerous pruritic blebs have been appearing on the lesion on the leg, which has slowly increased in size. The patient traumatized this area two months ago, and a small ulcer has developed. Dyspnea and edema of both legs have been present for ten years.

There is a large palm-sized slightly raised plaque on the anterior surface of the right leg showing pigmentation, depigmentation and atrophy. Portions of the area are red. There is a fixed nodular feeling to the lesion, and some deep-seated translucent nodules are seen. A sharply marginated dime-sized ulcer with a purulent base occupies the center of the lesion. There is moderate pitting edema of the lower part of both legs. No varicosities are seen in either leg. A white atrophic area the size of a quarter-dollar is present in the umbilicus. The remainder of the conditions observed on physical examination are normal.

The Kline reaction of the blood was negative. The hemogram and urine were normal. The basal metabolic rate was + 17 per cent on two occasions. The electrocardiogram was normal.

Histologic examination revealed atrophy of the epidermis, with flattening of the rete pegs and increased collagenous tissue and areas of hyalinization in the corium. There was dilatation of the superficial blood vessels, which were decreased in number. A moderate perivascular infiltration with small monocytes was present.

Generalized Progressive Scleroderma Treated with Hyperpyrexia Produced by the Electric Blanket Method. Presented by DR. GEORGE M. STROUD.

M. T., a Negress aged 32, presented from the department of dermatology and syphilology, University Hospitals, was shown before this society a year ago (ARCH. DERMAT. & SYPH.

47:125 [Jan.] 1943) because of generalized progressive scleroderma of two years' duration. She also has late latent syphilis which has been arrested by treatment. Treatment in the past, consisting of the administration of alpha tocopherol acetate with pyridoxine and deep roentgenotherapy over the upper dorsal and lumbar areas, has been of no value. Progression of the disease in the past year has resulted in semi-invalidism caused by weakness and limitation of motion in the joints of the arms and hands.

The skin of the entire body with the exception of the back is thick, "hidebound" and shiny. The maximal changes are in the areas of depigmentation, which spare the follicular openings, on the face, the neck, the arms, the anterior portion of the trunk and the legs. There is slight limitation of motion of the jaws, shoulders and arms.

The hemogram, urine and electrocardiogram were normal. Serologic tests of the blood for syphilis elicited weakly positive reactions. Roentgenograms of the chest showed insufficient increase in the pulmonary markings to justify a diagnosis of pulmonary fibrosis. Roentgenograms of the hands revealed absence of portions of tufts of the distal phalanges of the right second and third digits and of both thumbs.

Histologic examination of a section of skin removed from the left arm revealed slight hyperkeratosis. The epidermis was slightly decreased in width, and the rete pegs were absent. There was a large amount of pigment present in the malpighian layer. The corium was increased in width owing to the wide collagenous bundles, which were relatively acellular. A few dilated blood vessels surrounded by a mononuclear infiltrate were present in the papillary portion of the corium. There was a paucity of hair follicles and sweat glands; the latter were dilated. A section of the biceps muscle was normal histologically.

About two months ago two paroxysms of fever were induced by typhoid vaccine. Since then by means of an electric blanket, periods of elevation of temperature to 40 C. for four hours have been produced on five occasions. As a result, the skin has become more flexible and the range of motion in the jaws and arms has been increased. This was paralleled by improvement in talking, dressing and ability to sew.

A Case for Diagnosis (Circumscribed Scleroderma? Lupus Erythematosus?). Presented by DR. E. W. NETHERTON.

L. T., a girl aged 16, states that six years ago numerous small red spots appeared on the anterior surface of the left thigh. These lesions enlarged slowly and became confluent, forming a large thickened area involving the left buttock and the lateral, anterior and inner surfaces of the left thigh. Small lesions have continued to develop near the periphery of the large plaque. During the past few weeks a permanent flush or livid discoloration has developed on the cheeks, hands and lower portion of the arms.

There is a large brownish red mosaic-like plaque involving the lateral surface of the left buttock and extending downward and inward to the inner surface of the thigh just above the knee. The plaque is a composite of several smaller lesions that have coalesced. As a result, there are rounded and irregular whitish smooth sclerotic areas, glossy or ivory colored, scattered throughout the lesion. The zones surrounding these areas are brownish red and slightly scaly. The plaque as a whole is thickened and sclerotic. There are several pea-sized to dime-sized rounded dull red satellite lesions. The larger of these has a smooth sclerotic central portion.

There is a light red flushing of the cheeks, forehead and circumorbital areas. The dorsal surfaces of the hands, fingers and lower portions of the arms show a more livid discoloration. This is especially noticeable when the arms are in a dependent position. Her temperature today is 99.4 F.

A specimen for biopsy was removed with a punch from one of the largest satellite lesions. The following observations were made on histologic examination: The epidermis was normal except for the obliteration of most of the interpapillary pegs by changes in the corium. There was slight edema in the subpapillary upper portion of the corium. The blood vessels in the upper portion of the corium were dilated and surrounded by a loosely packed lymphocytic infiltration. There was some perivascular infiltration in the deeper layers of the corium. The most decided change was hypertrophy of the collagenous tissue throughout the corium. Pilosebaceous follicles and sweat glands were present, but they were closely surrounded by dense connective tissue. The elastic tissue was present in a normal amount and was not fragmented.

The Wassermann and Kahn reactions of the blood were negative. The hemogram and a roentgenogram of the chest were normal.

DISCUSSION OF THE PRECEDING CASES

DR. H. J. PARKHURST, Toledo, Ohio: I thought that in the first case the lesions on the shin approximated the color of skin of necrobiosis in the absence of glycosuria, but when I saw the patch below the umbilicus I changed my mind. I now agree with the diagnosis of localized scleroderma with probably some secondary inflammatory changes on the shin.

In the second case I was interested to see the apparent improvement following fever therapy.

In the third case I felt that the patches on the thighs were localized scleroderma and that the erythema with some edema of the face, neck and fingers might be an incipient scleroderma, although I grant there are other possibilities.

DR. H. N. COLE: In connection with the second case and the use of fever therapy, Dr. Charles Dennie has been enthusiastic about the use of this type of therapy in the treatment of scleroderma. He uses the hot bath and claims to get good temperatures with it. Dr. Paul O'Leary uses fever therapy a great deal. I have seen some good results and some that were not so good. Apparently it is giving some beneficial effect here.

In connection with the third case, it is interesting to see a scleroderma of the so-called spot and band type following the course of a nerve as this seems to be, but I was more interested in the other condition than in the scleroderma. I suppose it would be possible for this patient to have some rise of temperature with a circumscribed scleroderma, but I was under the impression that the disease might be disseminated lupus erythematosus. This girl works with cattle a great deal, and it is possible that she may have Bang's disease.

DR. R. E. BARNEY: As to the third case, I felt much the same as Dr. Cole did, and I think that it exhibits the close relationship between erythema multiforme associated with visceral disease and acute disseminated lupus erythematosus. I think that at the present time the eruption resembles erythema multiforme more than acute disseminated lupus erythematosus, but I do not believe that any one can make a definite diagnosis until the patient has been followed for some time. The possibility of a Libman-Sacks syndrome, with its cardiac or visceral involvement, should be considered.

DR. E. W. NETHERTON: The lesion on the thigh is interesting from another point of view, namely, that the large lesion is composite. It has been formed by the confluence of a number of smaller lesions. Ordinarily, the lesions of morphea enlarge by peripheral extension and may become confluent when they are located near each other. The histologic picture is that of scleroderma rather than of lupus erythematosus. The erythema involving the face, hands and upper portion of the chest is of recent origin. The distribution of the erythema is that seen in acute lupus erythematosus. The erythema involving the face and upper portion of the chest is rather diffuse and is not a multiform, or polymorphous, type of eruption. There are no discrete papules or well demarcated plaques, such as occur in erythema multiforme. Furthermore, erythema multiforme usually tends to subside and recur, while in this case the eruption has remained as it is since its onset. One has to consider the fever in this case and also the fact that the patient is not acutely ill. The hemogram is normal. With acute lupus erythematosus one expects to encounter a leukopenia, which does not exist here. This patient may have a toxic erythema due to some infection such as undulant fever, as has been suggested by Dr. Cole. However, I agree with him that acute lupus erythematosus is the probable diagnosis. It is sometimes difficult to establish a diagnosis of undulant fever.

DR. H. A. HAYNES JR., Akron, Ohio: If one wants to make an agglutination test, it should be made before any other procedure is done; and if it elicits a negative reaction, that does not rule out the presence of brucellosis, inasmuch as about 60 to 70 per cent of the tests for agglutination on patients with chronic brucellosis give negative results. Then an intradermal test with brucellin may be made, but the agglutination test should be made first because it is known that frequently an intradermal test which has elicited a weak reaction will change a negative agglutination reaction to positive.

DR. GEORGE M. STROUD: At the Duke University Hospital it has been found that culture of the blood and biliary drainage for brucella organisms is valuable in establishing the diagnosis of brucellosis. Perhaps these investigative procedures might be useful in this case.

Rhinophyma. Presented by DR. W. R. HUBLER.

J. B., a white man aged 59, presented before this society on Oct. 22, 1942 (ARCH. DERMAT. & SYPH. **47**:868 [June] 1943), is again presented from the department of dermatology and

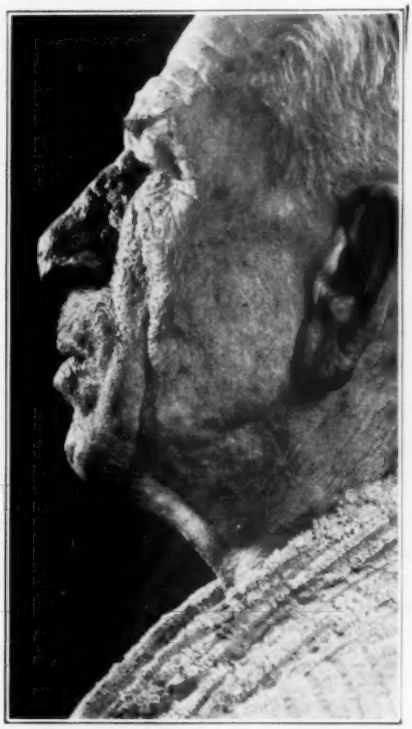
syphilology, University Hospitals, to show the therapeutic result following a two stage plastic repair of a rhinophyma, completed in December 1942. Compare his appearance now (fig.) with the photograph previously published.

DISCUSSION

DR. B. F. BARNEY, Columbus, Ohio: May I ask exactly how this operation was performed?

DR. W. R. HUBLER: Before operating, the surgeon inserted a number of needles into the mass as a guide at the level he intended to cut down to, because the field is usually obscured by free hemorrhage during the operation. Then with a razor he shaved down to the needles. On the one side the needles were apparently placed too low, as he cut into cartilage.

DR. B. F. BARNEY, Columbus, Ohio: I have performed three such operations: one by the old method, with a hot soldering iron, and two with an electric knife; in neither of the latter did I use an actual scalpel. I feel that it is justifiable to use the cautery. One should



Result of plastic repair for rhinophyma.

try to get a picture of the patient before the enlargement has taken place, and by sense of touch one cuts down with the dull edge. This is really scraping instead of cutting, and it goes down approximately to the cartilage. Petrolatum dressings are then applied and are left on for approximately a week, during which time much pus forms. After it has been removed, granulation takes place rapidly; with warm saline dressings healing takes place rapidly, and the cosmetic results are excellent.

Amebiasis Cutis. Presented by DR. W. R. HUBLER.

M. Y., a white woman aged 29, presented from the department of dermatology and syphilology, University Hospitals, has had intermittent ulceration of her legs since November 1933. She attended the Chicago World's Fair in 1933. One month later diarrhea developed, and she has had it recurrently for nine years. Her stool has varied from a red liquid to soft, semiformed feces, with only occasional formed stools. The course of the eruption has followed fairly closely that of the diarrhea. The cutaneous lesions usually appear as soft hemorrhagic abscesses. These extrude dark bloody material when lanced and leave deep

ulcers with undermined ragged edges which heal slowly. The process has appeared on both legs and the left hand at different times. Atrophic depressed scars remain after healing.

After a combined course of treatment with emetine hydrochloride and chiniofen given recently, the patient volunteered the information that her stools were more formed. This effect lasted only a few days, however, and her stools are now poorly formed.

The patient has been having red painful nodules on the outer surfaces of both arms appearing at the rate of about one a day beginning five days after completion of a course of injections of emetine hydrochloride and apparently corresponding to the exact sites of these injections.

The physical examination reveals normal conditions except for a large area of pink scar tissue covering the anterior and lateral aspects of the right leg. There are a few ulcerations several millimeters to 1.5 cm. in diameter within the scarred area.

There is a fluctuant subcutaneous abscess on the lateral side of the left forearm. Small atrophic scars are seen on the left hand and left leg. The urine and hemogram were normal. On admission a moderate hypochromic anemia was found. The Kline reaction of the blood was negative. Roentgenograms of the affected leg showed only slight demineralization of the tibia.

Fluoroscopic and roentgenologic examination of the colon made before and after evacuation of a barium sulfate enema showed arrest of the flow of barium in the midsigmoid portion of the colon. The lumen was narrowed from the midtransverse to the midsigmoid region. The mucosal pattern of the transverse colon had a granular appearance. This change was considered fairly characteristic of amebiasis by the consultant proctologist.

Complete bacteriologic studies, for both aerobic and anaerobic organisms, revealed only hemolytic staphylococci.

Repeated examinations and cultures of the stools did not indicate the presence of amebas. The test for occult blood gave strongly positive results on all stool specimens examined to date. Proctoscopic examination showed no ulceration characteristic of amebic dysentery.

Histologic examination revealed only organizing acute inflammation of the skin.

DISCUSSION

DR. C. G. LAROCCO: I have nothing to say with reference to the amebiasis. However, I wonder how much of the eruption may be factitial in origin. The thought that came to my mind as I examined the patient was that she is the type of person who might have something to do with the production and continuation of the process.

DR. E. C. STERN: The biopsy showed many new capillaries, with thickening of the endothelial lining of some. This gives one the impression of capillaritis.

DR. J. R. DRIVER: We thought of the possibility of factitial dermatitis in this case, but since the patient has been observed in the hospital I feel sure that she has not produced the lesions. The lesions start as abscesses which rupture and leave ulcers with undermined edges. Because she has suffered from dysentery since visiting the World's Fair in Chicago in 1933, we thought that we were probably dealing with amebiasis of the skin. However, we have made extensive search for the organisms and have been unable to find them. The roentgenograms of the colon presented a striking picture which the hospital roentgenologist and the consulting proctologist felt was strongly suggestive of amebiasis. Sulfathiazole administered by mouth was of no benefit. The ulceration has healed remarkably since institution of treatment for amebic dysentery and local application of a weak solution of silver nitrate and other antiseptics. I still feel that amebiasis of the skin is the most likely diagnosis.

DR. H. A. HAYNES JR., Akron, Ohio: Have roentgenograms of the patient's gastrointestinal tract shown any change since she has been under treatment?

DR. J. R. DRIVER: There was little change over a period of one month.

DR. E. W. NETHERTON: Have these lesions ever looked like pyoderma gangraenosum? I note from the history that this patient has a gastrointestinal complaint, and I wonder if the case does not fit into the classification of the cases which have been reported from the Mayo Clinic? In their series there were cases of gastrointestinal complaints such as colitis. One is usually able to find amebas in the stool in amebic dysentery. Dr. Engman and Dr. Heithaus demonstrated amebas in the cutaneous lesion in the case they reported.

DR. J. R. DRIVER: The lesions resembled the descriptions of amebic ulceration seen in abdominal wounds.

DR. GEORGE M. STROUD: I think that the painful nodules at the sites of injection of emetine hydrochloride were caused by a process similar to the Arthus phenomenon. It is

fairly well known that this reaction may follow injections of insulin, but it has been reported also following repeated injections of epinephrine hydrochloride.

Cavernous Hemangioma of the Scalp Treated by Interstitial Irradiation with Low Intensity Radium Needles. Presented by DR. GEORGE M. STROUD.

R. L., a child aged 3½ years, presented from the department of dermatology and syphilology, University Hospitals, has been observed frequently since a cavernous hemangioma, noted shortly after birth over the right side of the occiput, was treated by interstitial irradiation with low intensity radium needles. The tumor, the size of a hen's egg, was first treated with these needles two and a half years ago for forty-eight hours. The dose was 288 milligram hours. Four months later the lesion had improved only slightly; therefore radium needles were again inserted for seventy-two hours, which produced 432 milligram hours of irradiation. Since then there has been a remarkable regression.

At present there is an area of white atrophic skin 4 by 5 cm. in extent. Growth of hair on the area is approximately the same as before the treatment was given.

DISCUSSION

DR. H. J. PARKHURST, Toledo, Ohio: It is my impression that practically all cavernous hemangiomas disappear spontaneously sooner or later. I should like to know the opinion of the other members regarding that.

DR. H. N. COLE: It is true that this has been called to the attention of the medical profession—the tendency for many cavernous hemangiomas to disappear spontaneously as the years go on. On the other hand, they all do not disappear. I have observed cases in which they did not, and to predict which one is going to disappear and which one is going to stay is rather difficult; therefore it seems to me that in a case of this sort it probably will be safer, particularly if the lesion is an area where there is a question of the cosmetic appearance, to treat it if it can be done without scar formation.

DR. R. E. BARNEY: In this connection, it is my impression that the majority of pediatricians will advise mothers who have babies with small hemangiomas to leave the lesions alone and observe them for a while, hoping that they will disappear. I think that question is answered by Dr. Cole's remarks. The small hemangiomas are so easily treated, with excellent cosmetic results, that I think one is not warranted in taking chances that they may become larger and more difficult to treat later on, with greater scar formation. I feel that the time to treat the lesion is when it first appears.

DR. H. A. HAYNES JR., Akron, Ohio: In further comment on hemangiomas in infants careful questioning will reveal that probably not half of the lesions are present at birth and the majority usually appear from two weeks to a month after birth. I agree with Dr. Barney that they are easier to treat while they are small. Their tendency is usually to grow in the first few months of life; but, in addition to the fact of size, the younger the infant the more readily the hemangioma will respond to any type of treatment, either with radium or with solid carbon dioxide.

DR. J. R. DRIVER: I believe all of us will agree to the early treatment of these lesions, before they become large and at a time when they are comparatively radiosensitive. I should like to make a few remarks concerning this particular case. If the lesion is in the scalp, as it is here, and radium is applied to the surface or roentgen rays are employed, there is some danger of producing permanent alopecia. However, if radium is used interstitially in the base of the tumor the dose is least on the surface. In this case there was apparently no loss of hair caused by the irradiation.

DR. B. F. BARNEY, Columbus, Ohio: Dr. Driver remarked about the use of roentgen rays. I have seen only 3 or 4 hemangiomas treated with roentgen rays, and they have all been radioresistant. Has any one encountered one that responded to roentgen therapy?

DR. J. R. DRIVER: They will respond to filtered roentgenotherapy. Large doses are not required. Two hundred roentgens once a week for four or five treatments usually suffice.

DR. H. N. COLE: All dermatologists are familiar with this type of hemangioma in babies, for which most of the experts advise that nothing be done. It is true that some disappear without therapy. However, this last week I saw a man about 40 years old with an extensive V-shaped hemangioma on his forehead.

DR. R. E. BARNEY: While we are discussing this subject, I should like to mention a type of nevus that I have seen on several occasions in infants; the lesion occurs in the middle of the forehead and sometimes on either side of the nose and on the chin. It is not clinically a cavernous hemangioma but resembles more closely a port wine nevus. I have followed

some of these and found that they disappear spontaneously. In the patient shown today there is apparently some hemangioma left. Would it be possible to clear this up by use of solid carbon dioxide after the radium?

DR. J. R. DRIVER: I think so.

DR. C. L. BASKIN, Akron, Ohio: In treating these small hemangiomas or residual ones, I use boiling water, with the handle of a hemostat pressed over the area. In this case today it would be effective for the residual lesion. This treatment can be used on the lip of a baby when one would have difficulty in keeping a plaque of radium on it. A blunt heavy needle is put on the syringe and the whole apparatus boiled with the water in it; it is then handled with a towel.

DR. E. W. NETHERTON: That treatment was used years ago by surgeons.

DR. C. L. BASKIN, Akron, Ohio: The results are good when the infant is young, as this child is today. If one is afraid that the infant will lose hair, I should recommend the use of hot water. Do not treat too much; use 2 cc. of boiling water for a lesion the size of a hazelnut. Hold a hemostat handle pressed into the scalp, and do not let the water spread any more than desired. This treatment is not as painful as one would imagine.

DR. R. E. BARNEY: I think superficial lesions on the lip respond to solid carbon dioxide. I treated one during the past month and was a little concerned about it. There was decided edema, and I thought that the resulting reaction might interfere with the baby's nursing. The lesion responded in one treatment and did not interfere with feeding.

DR. C. L. BASKIN, Akron, Ohio: What of the possibility of scarring and of a cracked lip?

DR. R. E. BARNEY: The lesion healed without apparent scar.

DR. E. W. NETHERTON: I agree that such hemangiomas should be treated early, and I believe irradiation treatment is best if it can be used. They can be cured without much discomfort, and they usually respond well to treatment.

A Case for Diagnosis (Gumma of the Mouth with Pseudoepitheliomatous Hyperplasia? Seborrheic Dermatitis? Psoriasiform Parakeratosis of the Skin?). Presented by DR. W. R. HUBLER.

W. A., a white man aged 65, presented from the department of dermatology and syphilology, University Hospitals, has had a painful ulcer in his mouth for six weeks. It has become progressively larger. Forty-five years ago he had a persistent ulceration of the gum for two months accompanied with painful swollen cervical lymph nodes.

He has had a scaly eruption on his left arm and chest at frequent intervals for twenty-four years.

There is a serpiginous superficial ulceration with irregular borders and a necrotic base on the mucous membrane of the upper lip and anterior portion of the hard palate. A slight erythematous halo is present. There are no palpable lymph nodes in the neck.

Two polycyclic palm-sized reddish yellow scaly patches with a few smaller lesions of the same type are present on the upper portion of the chest, and one is present in the gluteal cleft.

The hemogram and urine were normal. The Kline diagnostic and exclusion reactions of the blood were strongly positive. The spinal fluid was normal.

Histologic examination of the oral lesion revealed acanthosis and elongation of the rete pegs. A round cell infiltrate was present in the upper portion of the corium. Perivascular infiltration was well marked, and many plasma cells were seen.

The histologic picture of a section from the lesion on the chest showed chronic inflammation.

DISCUSSION

DR. H. G. MISKJIAN: I have nothing to say about the lesions in the mouth, but I have been interested in the lesions on the chest, where the man has two sharply defined red and scaly chronic patches accompanied by itching. They are commonly called seborrheic dermatitis, but when one stops to think one realizes that they are neither seborrheic nor dermatitis. The diagnosis of seborrheic dermatitis is applied to so many different types of eruption that I find it impossible to determine what they have in common.

In my efforts to gain a clearer conception of cutaneous diseases, I came across the studies of Brocq in which he had reported a group of cases with certain common features under the name of psoriasiform parakeratosis. This is a morphologic, not etiologic, classification that includes all eruptions which more or less resemble psoriasis by their sharply defined red and scaly patches but which can be easily distinguished from it. The lesions on this man's chest offer a striking example of psoriasiform parakeratosis. This syndrome is not uncommon.

Every dermatologist must surely have seen patients presenting this type of eruption in clinic and office practice. The term "dermatitis" does not fit these eruptions, because they are characterized by sharply defined red and scaly patches and not by a diffuse rash occupying more or less extensive areas. In my opinion, it is as improper to call such an eruption dermatitis as it would be to include psoriasis itself in the dermatitides. As regards the designation "seborrheic," that word has a definite meaning; it cannot and should not be applied to a lesion that is not oily. On the other hand, the name "psoriasiform parakeratosis" fits these eruptions perfectly, because they look like psoriasis and they are covered with scales, the result of that peculiar change in the epidermis defined as parakeratosis.

Brocq has described three types of psoriasiform parakeratosis, of which I shall mention only two. The first is the dry type, which resembles true psoriasis most closely. Today's patient presents a good example. The second is the wet, exuding or "eczematized," type. The patches of this type are often located in the axillas, groins and articular folds. I think what some persons call inverse psoriasis is in most cases nothing but a psoriasiform parakeratosis.

A whole series of transitions exists between the two extremes of dry and wet types. Psoriasiform parakeratosis is almost always itchy, while true psoriasis is not. The histologic picture is that of psoriasis with the addition of lesions found in eczema: edema, spongiosis, intraepidermal vesiculation, etc. Of course, these eczematoid lesions are most pronounced in the wet type. Recent studies tend to show that at least in some cases psoriasiform parakeratosis, especially of the wet type, is the result of an infectious process.

Psoriasiform parakeratosis responds to treatment, particularly with roentgen rays. It is different from and must not be confused with parapsoriasis.

Dr. H. J. Parkhurst, Toledo, Ohio: It is the feeling of a number of dermatologists that in most of the cases of Brocq's dermatosis which have been observed in this country the disease has terminated as mycosis fungoides. In nearly every case those two diseases are discussed.

Dr. E. W. Netherton: Is there any way one can differentiate between these two diseases? I refer to their clinical characteristics.

Dr. H. G. Miskjian: Pruritus in the premycotic stage of mycosis fungoides is much more intense than in psoriasiform parakeratosis. The patches are persistent; they remain as they are and do not respond to treatment. In diagnosis I depend a great deal on the slight but definite infiltration that patches of mycosis fungoides often present. Psoriasiform parakeratosis does not have this type of infiltration. The fact that the eruptive patches clear up under treatment will naturally also rule out mycosis fungoides. It is said that parapsoriasis sometimes develops into mycosis fungoides, particularly when it is associated with itching. By definition, parapsoriasis is devoid of itching. Therefore, any eruption that itches cannot be classified as parapsoriasis. Probably parapsoriasis that developed later into mycosis fungoides was true mycosis fungoides with an unusually long premycotic stage diagnosed incorrectly as parapsoriasis.

Dr. R. E. Barney: I think one must realize that the initial stage of mycosis fungoides may resemble any of the diseases mentioned, such as seborrheic dermatitis or lichen planus or psoriasis. This first stage passes into the second, or plaquelike, stage, eventually ending in the last, or tumor, stage. I think it is dangerous to make a diagnosis of mycosis fungoides on the basis of a subjective symptom that may vary from one case to another. I think that in this particular case that diagnosis should be entertained. I do not know whether the oral lesion preceded or came after the cutaneous eruption, but I have seen mycosis fungoides begin in the mouth and remain limited to it for a period of months before any cutaneous lesions appeared. In the present case there are definite inflammatory plaques associated with ulcerations in the mouth. It may be the second stage of a mycosis fungoides. The case should be followed. If the lesion is a gumma, it should respond to treatment promptly.

Dr. H. N. Cole: I think the lesion in the mouth is syphilitic.

Note.—The oral lesion healed after seven injections of a liposoluble preparation of bismuth. The cutaneous lesions have not responded to the antisyphilitic therapy or to local applications of ointment.

Poikiloderma Atrophicans Vasculare (Jacobi). Presented by Dr. J. R. Driver and Dr. H. N. Cole.

F. S., an unmarried Jewess aged 25, states that at the age of 5 years the skin on the flexor surfaces of her forearms became reddish and scaly. Sometime later areas of pigmentation appeared in the eruption. By the time she was 14 years old, the eruption had gradually

spread and then involved the entire surfaces of her arms. Since then it has spread progressively until now the eruption has become practically generalized with the exception of her face. There are no subjective symptoms. At the age of 6 years she was severely ill with measles; otherwise her general health has been good. An only sister, aged 30, has normal skin. Her mother is living and well. Her father has diabetes.

General physical examination revealed normal conditions with the exception of a moderately enlarged thyroid gland. The skin of the arms is uniformly involved by an eruption consisting of scaly punctate erythematous stippled spots with areas of pigmentation, punctiform telangiectasia and atrophy. On the trunk there are patches of similar character that are palm sized and smaller, with intervening areas of apparently normal skin. On the sides of the neck the eruption is characterized by erythematous petechia-like pigmented areas and atrophy in linear arrangement resembling anetoderma or reticular atrophy. Involvement of the legs and thighs is like that on the arms. In none of the involved areas is there evidence of scleroderma or infiltration of the skin. The mucous membranes are uninvolved, and the teeth and nails appear normal.

The eruption in general presents the picture of a scaly erythroderma consisting of brownish red pigmentation and white dots arranged as a network or reticular varigated marbling with a background of atrophy. The similarity to old radiodermatitis is strongly suggestive.

The hemogram and urine were normal. The Kline reaction was negative. Roentgenograms of the chest revealed normal conditions. The basal metabolic rate was —7 per cent. The fasting sugar content of the blood was 82 mg., the vitamin C content of the plasma 0.3 mg., the cholesterol content 221 mg., the calcium content 12 mg., the phosphorus content 3.6 mg. and the uric acid content of the blood 3.4 mg., per hundred cubic centimeters. The phosphatase activity of the plasma was 6.5 Bodansky units.

Histologic examination showed skin which had an intact covering of squamous epithelium. The epithelium showed considerable keratinization and definite atrophy. The epithelial pegs were entirely absent. The basement membrane of the epithelium was intact. In the upper portion of the dermis there was considerable infiltration with lymphocytes and large round cells. There was also collagenous degeneration of the connective tissue of this portion of the dermis. There were hair follicles and sweat glands in the deeper portions of the dermis, and in this region there were a few scattered collections of inflammatory cells similar to those already mentioned. The elastic tissue appeared fragmented.

DISCUSSION

DR. J. E. FISHER: I think this is a clearcut example of poikiloderma atrophicans vasculare, and I agree with the diagnosis. This case is so well worked up that there is little that I can add to it.

DR. R. E. BARNEY: The long duration and extensive character of the process without any apparent explanation are striking. I have seen a patient with lymphosarcoma who presented cutaneous changes comparable to these. There are cases in which the disease begins with the clinical picture of poikiloderma and later changes suggesting mycosis fungoides develop. It would be interesting to follow this patient to see what eventually happens.

DR. H. A. HAYNES JR., Akron, Ohio: Do you believe that the poikiloderma of Civatte on the upper part of the chest and neck is the same as the poikiloderma of Jacobi? It looks similar but is confined to the upper part of the chest.

DR. J. R. DRIVER: The so-called poikiloderma of Civatte is the same as the melanosis of Riehl and should not be included in the poikiloderma group at all. This patient's disease corresponds closely to the type described by Jacobi and several American authors as poikiloderma atrophicans vasculare. All such patients should be observed over long periods for the possible development of mycosis fungoides or lymphosarcoma. A number of such instances have been reported in the literature. Wise has expressed the belief that all manifestations of the Jacobi type are probably forerunners of some grave internal disorder. The scaly type of lesion that this woman presents seems to take on such changes more than those that do not present so much scaling.

DR. H. N. COLE: The remarkable thing about this patient is that she has had the disease since she was 5 years old. We have had her in the hospital, and she reveals no internal disturbance that we can make out. She has some areas, on the inner aspect of her arms particularly, that have a sort of retiform reticulated appearance that resembles somewhat the picture that is seen in some of the ectodermal dysplasias (Cole, H. N.; Rauschkolb, J. E., and Toomey, J.: Dyskeratosis Congenita with Pigmentation, Dystrophia Unguis and Leuko-

keratosis Oris, ARCH. DERMAT. & SYPH. **21**:71 [Jan.] 1930). Engman (Engman, M. F.: A Unique Case of Reticular Pigmentation of the Skin with Atrophy, ARCH. DERMAT. & SYPH. **13**:685 [May] 1926) spoke of the gunmetal appearance of the skin. Another patient we had showed the same appearance. However, this patient has no involvement of the nails or mucous membrane. The disease did not start until she was 5 years old, and I cannot feel that it is an ectodermal dysplasia nor do I think it is a parapsoriasis. There is too much atrophy. The histologic picture seems to be compatible with that which is reported in other cases of poikiloderma atrophicans vasculare.

Lupus Erythematosus of the Face Associated with Nodular Infiltrations of the Back.
Presented by DR. H. G. MISKJIAN and DR. E. C. STERN.

Mrs. B. S., aged 41, while in Florida about three years ago had an infection of the right antrum, which was treated with a sulfonamide compound. A year later she had dizzy spells, hot flashes and other symptoms, which were considered as incidents of the menopause. Twice she underwent a thorough physical investigation in two different hospitals under the direction of highly competent physicians. Various tests were performed, but nothing abnormal was found. However, she gives a history of a swelling of her eyelids that comes unexpectedly every now and then and is sometimes accompanied with a slight rise in temperature, to about 101 F. These symptoms last a day or two and disappear. The edema of the eyelids is white but often intense enough to close the patient's eyes. Besides this, she suffers from some rheumatic pains in the fingers, knees and other joints, particularly when the weather is damp. That she has no serious organic trouble is shown by the fact that she has been gaining in weight. She weighs at present 121 pounds (54.9 Kg.).

In May 1942 a small flat red area appeared on the right side of her nose. We saw the patient for the first time on July 18 and a diagnosis of lupus erythematosus was made from the presence of seborrheic plugs. New patches have developed and spread since then. The lesions on the back appeared early in August. By September they were definitely constituted, but they were small and few. They have now become much larger and more numerous. There are no subjective symptoms worthy of note.

The patient is a well developed, well nourished woman of average height and nervous temperament. On her face there are a number of red patches of lupus erythematosus. These lesions have two unusual features: 1. They are not quite symmetric, there being more patches on the right side than on the left. 2. On their surface they present numerous small red dots, which on closer scrutiny are found to be perifollicular.

On the patient's back, extending from the suprascapular regions to a little below the base of the thorax, there are numerous slightly elevated, vaguely dome-shaped, poorly defined areas on the skin, which are particularly apparent when viewed from the side. Their color is that of the normal skin or perhaps slightly whiter. Some of them have a pink tinge. Recently many of these white and pink lesions have become definitely red, and on the surface of some small red dots have developed. Each of these dots encircles a slightly funnel-shaped follicle. On palpation the dome-shaped areas are found to consist of an intracutaneous infiltration of the corium, continuous with the epidermis but freely movable on the deeper layers. This infiltration feels a little harder than the normal skin and is poorly defined. It is round or oval, and its horizontal diameter varies from 0.5 to 1.5 cm. Within the past month a few infiltrated areas or nodules have developed on the deltoid region, mainly of the left side.

Routine laboratory tests and roentgenograms made in the hospitals have shown nothing worthy of note.

A biopsy was performed while the patient was in New York to consult Dr. Lewis Robinson. Dr. Macchacek, who examined the section, could see "nothing very definite."

The patient has had two applications of solid carbon dioxide to the lesions on the face and six injections of a bismuth compound. In addition, she has been taking vitamin C, nicotinic acid in tablet form and liver extract capsules.

DISCUSSION

DR. HUGO HECHT: I first saw the patient's back and was under the impression that the tumors in the skin were multiple lipomas. The surface of the skin over a lipoma is always normal. But on the top of some of the tumors there were a follicular inflammation and also some atrophic lesions. The lesions on the face do not resemble lupus erythematosus. They are too red for this disease and are seborrheic around the nose.

I think it is a combination of acute lupus erythematosus and rosacea. The small tumors on the back may be some deep-seated kind of sarcoid. I recommend a new biopsy of the tumors and lesions of the face and also inoculation of guinea pigs. Sometimes it is possible to find tubercle bacilli in lesions of lupus erythematosus.

DR. H. J. PARKHURST, Toledo, Ohio: The lesions on the face at first glance resemble lupus erythematosus, but I tried to group the nodules on the back under the same heading, and I felt that there was a tuberculid of the follicular type on the face and of a nodular type on the back.

DR. E. W. NETHERTON: I suggest more investigation and further study, including another biopsy of the nodular lesions on the trunk.

DR. H. G. MISKJIAN: The lesions on the face have never been sarcoid. I saw the patient first in consultation on July 18. At that time she had a small oblong lesion on the right side of her nose. It was erythematous and scaly and looked like a dermatitis due to external irritation. By careful scraping I could detach some scales with characteristic thumbtack projections on their under surface. These were evidently follicular plugs, and on that basis I made the diagnosis of lupus erythematosus. But the disease is lupus erythematosus with special features. I think that the lesions on the back are an unusual form of a deep process that is of the same nature as lupus erythematosus.

This opinion is based on the following considerations: The red patches on the face are not raised, and on close scrutiny one finds on their surface a number of small dark red dots, less than 1 mm. in diameter, with a central depression. In other words, they are perifollicular lesions. These same perifollicular lesions are also present on the patch under the chin, but this patch has an infiltrated base which on palpation gives exactly the same feeling as the raised areas on the patient's back. It is therefore reasonable to suppose that all of these cutaneous reactions must be manifestations of the same process, namely, lupus erythematosus. No other definite cause having been found for the fever that develops now and then, that also must be considered a part of the same disease. The prognosis is far from bright.

Sporotrichosis; Localized Lymphatic Type. Presented by DR. E. W. NETHERTON.

E. C., a married woman aged 26, states that in October 1942 a small "pustule" appeared on the flexor surface of the right forearm just below the cubital fossa. There had been no previous injury. She applied a proprietary ointment which her father had used on a barbed wire abrasion on a teat of the family milk cow. The ointment had not been used on other domestic animals.

The teat healed promptly, but the pustule on her arm became a "boil" and finally developed into a chronic ulcer. In November three painless nodules appeared on the inner surface of the arm just above the elbow. They have enlarged slowly and have become red and soft. There have been no systemic symptoms.

There is a chronic irregular superficial ulcer 3 cm. in its greatest dimension just below the right cubital fossa. The overhanging margins are dull red and slightly infiltrated, and the base is covered by a purulent exudate. There are three cutaneous nodules on the inner surface of the right arm just above the elbow. They are in linear arrangement along the lymphatics and vary in size from that of a hazelnut to that of a pea. The larger nodules are located proximal to the ulcer and have broken down into cutaneous abscesses, while the lesions nearer the axilla are smaller and firmer. The larger lesions are light red, while the more recent, smaller, nodules are less erythematous. The axillary nodes are not palpable.

Cultures made of material from the ulcer as well as pus aspirated from one of the cutaneous abscesses showed a pure growth of Sporotrichum schencki. Cultures of the ointment applied to the lesions have yielded no organisms. The Wassermann and Kahn reactions of the blood were negative, and the hemogram was normal.

DISCUSSION

DR. E. W. NETHERTON: There is little to be said about this case, as it is typical of the lymphatic type of sporotrichosis. This disease is rare in this section of the country. In the number of years that I have been at the Cleveland Clinic we have observed only 3 cases, and it has been my privilege to present all 3 of these before this society. These cases were observed during the last three or four years. It may be that others have been seen but not recognized. However, we have been on the alert for this disease and have always made cultures in suspicious cases. The patient referred to by Dr. Baskin had an involvement of the tendon sheath of the wrist. He had a generalized type of sporotrichosis, and the other lesions responded well to prolonged medication with large doses of an iodide. The lesions on the wrist disappeared temporarily but have recurred on two or three occasions. The treatment of this disease consists of administration of large doses of iodides over long periods and use of roentgen therapy.